

Mercuric process makes sulfate-free
99% nitric acid 38

Remote metering and control pay
off in anhydrous HCl distribution . . 107

also more than 200 terse reports
on new processing techniques,
chemicals, instruments, equipment . 6

JANUARY 1959



CHEMICAL PROCESSING



Richard W. Kix Miller



Dr. W. G. Malcolm



Albert E. Forster



John B. Calkin

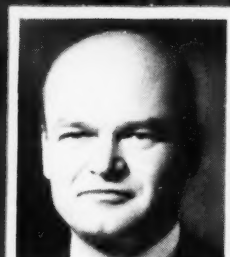


John R. Hoover

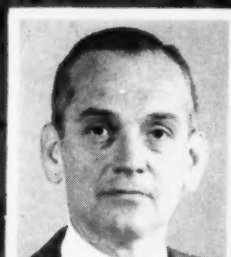
Another CP Exclusive...

What's in Line for '59? KEEN COMPETITION

Chemical Processing Leaders
View Business Picture
With Mixed Reactions . . . Page 25



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Stanley de J. Osborne



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TO STEP UP EFFICIENCY OF SULFONATIONS, SULFATIONS

...USE **SULFAN**[®]
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GENERAL CHEMICAL DIVISION

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Check 3145 opposite last page



conventions and exhibits

January 20-22. Association of American Soap & Glycerine Producers, Inc., 32nd Annual Convention, Waldorf Astoria Hotel, New York.

January 26-29. Fourteenth International Heating and Air-Conditioning Exposition, Convention Hall, Philadelphia.

January 26-29. Plant Maintenance and Engineering Show, Public Auditorium, Cleveland.

January 28-30. Society of Plastics Engineers, Inc., 15th Annual Technical Conference, Commodore Hotel, New York.

February 3-5. The Society of the Plastics Industry, Inc., 14th Reinforced Plastics Division Conference, Edgewater Beach Hotel, Chicago.

February 15-19. American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc., Annual Meeting, San Francisco.

February 18-19. Chemical Market Research Association, meeting on textile chemicals, Dinkler Plaza Hotel, Atlanta, Georgia.

March 2. Louisville Federation of Paint & Varnish Production Clubs, Annual Symposium, Sheraton Hotel, Louisville, Ky.

March 2-6. Tenth Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Penn-Sheraton Hotel, Pittsburgh.

March 13. American Institute of Chemical Engineers and the American Chemical Society, Sixth Annual Joint Technical Meeting, Lamar State College of Technology, Beaumont, Texas.

March 16-20. American Institute of Chemical Engineers, National Meeting, Chalfonte Haddon Hall, Atlantic City.

March 16-20. National Association of Corrosion Engineers, National Meeting, Sherman Hotel, Chicago.

... Meetings and shows of interest to the chemical industries

March 31-April 2. 21st Annual American Power Conference, sponsored by Illinois Institute of Technology, Hotel Sherman, Chicago.

April 5-10. American Chemical Society, 135th National Meeting, Boston.

April 5-10. International Atomic Exposition, Public Auditorium, Cleveland.

April 20-22. The American Oil Chemists' Society, Spring Meeting, Roosevelt Hotel, New Orleans.

May 3-7. The Electrochemical Society, Inc., meeting, Sheraton Hotel, Philadelphia.

May 10-13. American Institute of Chemical Engineers, meeting, Kansas City, Missouri.

May 17. American Society for Testing Materials, Seventh Meeting on Mass Spectrometry, Statler Hilton Hotel, Los Angeles.

June 1-5. Fifth World Petroleum Congress Exposition, Coliseum, New York.

June 9-12. The Material Handling Institute's Exposition of 1959, Public Auditorium, Cleveland.

June 22-24. American Society of Refrigerating Engineers, Annual Meeting, Lake Placid Club, Lake Placid, New York.

September 13-18. American Chemical Society, National Meeting, Atlantic City.

September 21-25. 14th Annual Instrument-Automation Conference and Exhibit, International Amphitheatre, Chicago.

September 27-30. American Institute of Chemical Engineers, meeting, St. Paul, Minnesota.

September 28-30. American Oil Chemists' Society, meeting, Hotel Statler, Los Angeles.

October 18-22. The Electrochemical Society, Inc., meeting, Deshler-Hilton Hotel, Columbus, Ohio.



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F-7

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MEMO TO:

All Plant Managers

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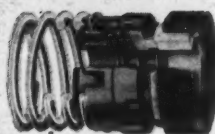
You'll find a "John Crane" Shaft Seal for every service . . . from hot or cold water to the most destructive acids and corrosives . . . high temperatures, high pressures . . . in types and sizes to meet practically any mechanical or dimensional requirement.

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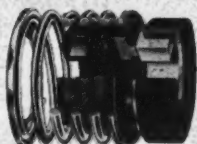
In Canada: Crane Packing Company, Ltd., Hamilton, Ont.

John Crane



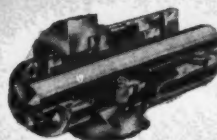
TYPE 1

Designed for limited stuffing box diameter. Handles water, light hydrocarbons, refrigerants, mild acids and other liquids non-injurious to synthetic rubber at temperatures from -40°F. to +212°F., pressures to 200 psi.



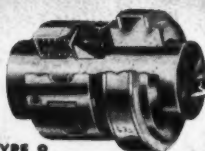
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with which is combined
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and Chemical Business

For the management team

More than 50,000 copies of this issue

Vol. 22

January 1959

No. 1

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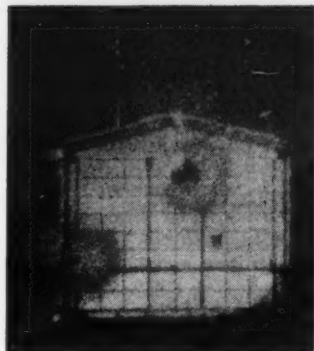
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CHEMICAL PROCESSING



that's interesting

Thought-provoking slants
on projects and products



Nuclear explosion . . .

. . . birth is depicted in this photograph of the cab atop steel tower, illuminated from within by fiery start of chain reaction. This picture was taken during the first sub-millionth of a second. Taken by famous "Rapatron" camera, the blast was timed, fired, and photographed for AEC by Edgerton, Germeshausen & Grier, Inc., nuclear instrumentation specialists.



It's not frayed thread . . .

. . . going through the eye of the embroidery needle. That's a real, fluted, solid cemented, carbide drill, magnified eight times. The diameter at the tip is about six times that of a human hair. Tiny precision drills, measuring 0.024" diameter, are being produced by Van Norman Industries' Detroit Div., Super Tool Co., for making holes in nonferrous and other highly abrasive materials. Drills are so wear-resistant they can drill hundreds of holes without the latter varying in size.

JANUARY 1959



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If you're confused by the number of coal tar-epoxy resin coatings on the market today, perhaps these few brief facts will clear the air:

1. Pitt Chem TARSET is the first patented coal tar-epoxy resin coating on the market.
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highlights



JANUARY 1959

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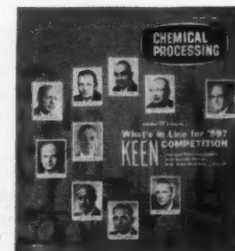
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THIS MONTH'S COVER

What's ahead for the chemical processing industries in 1959? These leaders view the upcoming year with mixed reactions. Some see a better profit picture. Others believe keener competition is in store, together with higher production and greater sales. One says any forecast of improved business should be based on restrained optimism. Read this exclusive Chemical Processing roundup beginning on page 25.



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SPECIAL READER SERVICES

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• To subscribe to this magazine, see reader-qualification form opposite last page



Spotlight On People

JOHN E. WOOD III becomes president of The Enjay Company, Inc., with KARL J. NELSON, HAROLD J. ROSE and A. DONALD GREEN as new vice presidents.

CHARLES A. WIGHT is new president of Freeport Sulphur Company, and PEARSON E. NEAMAN is new chairman of executive committee.

Changes in Allied Chemical Corporation divisions have JAMES F. FOX JR. as executive vice president and J. WARREN CAREY as a vice president of National Aniline Division; ARTHUR PHILLIPS JR. as vice president of Solvay Process Division, with VERNE W. AUBEL JR. as director of sales.

At Escambia Chemical Corporation, JOHN B. CLOPTON is made vice president and director of sales; ALBERT E. NEW, vice president and director of production, and DR. W. MAYO SMITH, vice president and director of research.

L. S. MECKLEY is elected a director of J. T. Baker Chemical Company.

RALPH T. URICH is named to board of directors of Reichhold Chemicals, Inc. He is vice president-general sales mgr.

T. H. ELDER is appointed sales manager of American Alcolac.

THOMAS L. BONNITT is manager of newly created Market Development Department at Morningstar-Paisley, Inc.

THOMAS M. HARTLEY is appointed sales manager-Ucon Refrigerants by Union Carbide Chemicals Company, Division of Union Carbide Corporation.

At The Chemstrand Corporation, EDMUND L. LAUBER is named director, merchandising, and M. R. DALTON director of sales.

J. JOSEPH KELLY joins Foster Grant Co., Inc. as director of marketing for polymer products and petrochemicals.

At American Cyanamid Company, M. H. METTEE is appointed sales manager of dyes department.

HAROLD E. FREDERICK is named sales manager, Phosphorous Div., Hooker Chemical Corp.

Maintaining maximum flow in serum lines with minimum pressure drop

Goodyear Tire & Rubber Company reports no valve clogging or interruption to flow in handling viscous fluids — with Grinnell-Saunders Straightway Diaphragm Valves.

Grinnell-Saunders Straightway Valves are now in use on serum lines of the Goodyear Tire & Rubber Company. Serum is a suspension of rubber particles in an acid brine solution. The installation pictured above is in Goodyear's Synthetic Rubber plant at Houston, Texas.

Grinnell-Saunders Straightway Valves were selected for this service because of their straight-through design. Material in process cannot build up and choke off flow because there are no pockets or gate trenches to trap solids. The straight-through feature also assures speed, ease and economy of rodding out, when necessary. When a diaphragm must be replaced — that job, too, can be done quickly, without removing the valve body from the line.

Isolation of operating parts from the fluid stream is still another important advantage of the Grinnell valve . . . eliminating corrosion and clogging of the valve

mechanism while, at the same time, preventing contamination of product in the line.

Grinnell-Saunders Diaphragm Valves are available in a wide range of body, lining, and diaphragm materials to meet different service conditions. To secure further information, contact the Grinnell branch office nearest you — or write directly to Grinnell Company, Inc., 277 West Exchange Street, Providence, R. I.



Open

Diaphragm lifts high for streamlined flow in either direction. No irregular surface to trap deposits.



Closed

Diaphragm presses tight for positive closure, even when handling viscous or fibrous materials.

GRINNELL-SAUNDERS DIAPHRAGM VALVES

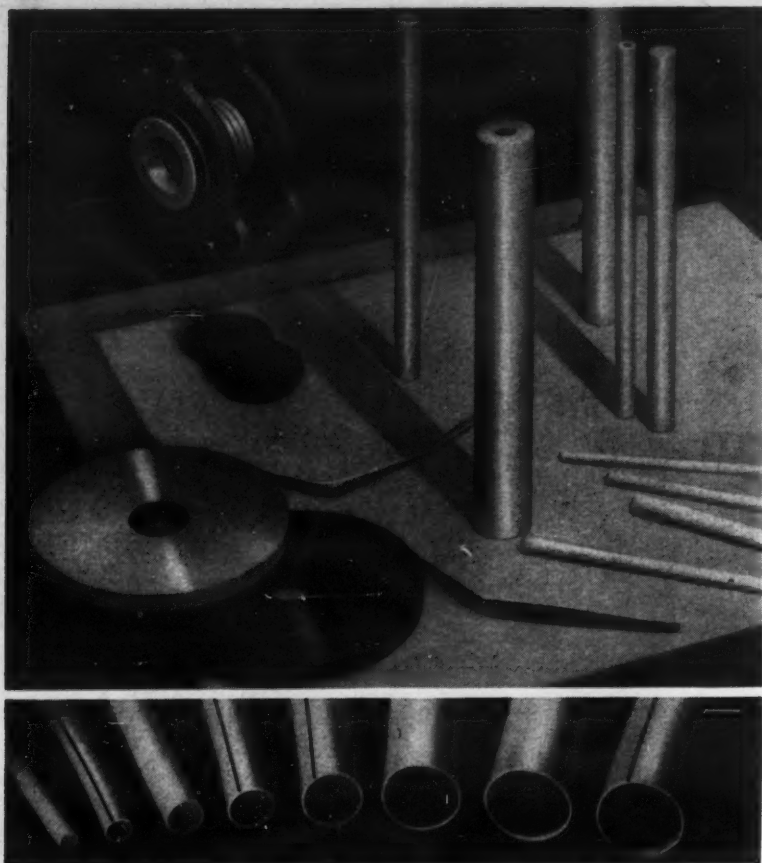


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industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

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A fraction of R/M's extensive line of "Teflon" products. (upper) New "Teflon" expansion joint has square convolutions for extra strength. Other products include sheets, tubes, rods, tape and bondable "Teflon." (lower) Thin-wall tubing is now available with or without color striping.

Take advantage of R/M'S COMPLETE TEFLON* SERVICE

Need 1/32-in.-thick "Teflon" in 36 x 36 in. sheets . . . 48 x 48 in. sheets of greater thicknesses? Or custom fabricated "Teflon" parts made to your exact design requirements? Whatever your "Teflon" needs may be, R/M's complete service—a broad range of sizes, plus ample facilities for extruding, molding or machining special pieces, precisely to your specifications—means faster, simpler meeting of your "Teflon" requirements—and assurance of complete satisfaction.

In addition, you can benefit from R/M's extensive research and development in the use of "Teflon." Competent R/M sales engineers are always available to assist you in making full use of its many unique properties.

For full information about R/M "Teflon" expansion joints, tubes, thin-wall tubing, rods, sheets, tape, bondable "Teflon," and "Teflon" parts, contact your nearest R/M district office. Or write for detailed literature.

*A Du Pont trademark



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Brake Blocks • Clutch Facings • Laundry Pads and Covers • Industrial Adhesives • Bowling Balls

Check 3150 opposite last page

CHEMICAL / Our Growing
BUSINESS Industry

Reichhold to Build New Plants for Phthalic Anhydride, Phenol

Facilities in New Jersey, Washington
to cost approximately \$10 million

Reichhold Chemicals, Inc. has announced it will build two new chemical plants — the combined cost of which will be approximately \$10 million — for production of phthalic anhydride and phenol.

Badger Manufacturing Company has been awarded the contract for design, engineering, procurement, and construction of the phthalic anhydride plant at Elizabeth, N. J., at a cost of nearly \$5 million. Target date for completion is early this fall.

Plant will use fluid bed process and will have an approximate capacity of 30 million lb a year.

Engineering work now is in progress for the phenol plant, to be built at Tacoma, Wash., at a cost of 4 to 5 million dollars. Construction is scheduled to start in latter half of year, with completion expected in latter part of 1960.

Plant will be capable of producing 60 million lb yearly following an initial production rate of 30 million lb. By-product sodium sulfite will probably be sold to paper industry in the Pacific Northwest. Company plans to implement operation of plant with research and development facilities.

Du Pont's Explosives Department will build a 50-million-lb/yr plant to manufacture caprolactam monomer on company's present plant site near Beaumont, Texas. Design and construction work will be under direction of company's central engineering department. Construction will begin early this year, with start-up planned for third quarter of 1960.

Allied Chemical Corporation also has moved to alleviate limited supply of caprolactam monomer as it scheduled start-up of expanded facilities at Hopewell, Va., for January 1. Expansion will give plant annual monomer capacity in excess of 60 million lb.

Allied also announced completion of a continuous naph-

thalene distillation unit — believed to be world's largest — at its Plastics and Coal Chemicals Division plant at Philadelphia (Frankford), Pa. Unit is modern replacement of a steam-heated and direct-fired three-column atmospheric and vacuum distillation facility which required battery of six centrifuges to produce 78°-mp naphthalene.

Metal Hydrides Incorporated's newly expanded plant at Beverly, Mass., has gone on stream to produce aluminohydride for hormone synthesis, vitamin preparations, and other pharmaceutical products. New plant, occupying 1000 sq ft of floor area not including basement and some outside space, will provide around-the-clock production rate to permit filling of quantity orders swiftly from inventory.

National Adhesive (Canada) Ltd., subsidiary of National Starch Products Inc., New York, has begun construction of vinyl emulsion polymerization plant in Toronto, Ontario. Engineering is being handled by Laughlin, Wyllie and Ufnal, Toronto. Plant, expected to be on stream by March 1, will provide initially for 5 million lb capacity annually and will be expandable to 8 million lb.

The Bunker Hill Company has announced plans for a \$10-million fertilizer plant to be built in the Pacific Northwest on a site yet to be selected. Facility is scheduled to go into production by July 1960, and is slated to have an annual capacity of 200,000 tons of fertilizer products. Plant is in addition to company's mod-

ernization and expansion programs currently in progress at lead and zinc reduction units at Kellogg, Idaho.

The Eagle-Picher Company has placed in operation a diatomaceous earth processing plant near Lovelock, Nev., the second such installation in that state. It is designed to produce 36,000 tons of natural and calcined diatomaceous earth products annually. Plant went on stream approximately nine months after Kaiser Engineers, Division of Henry J. Kaiser Company, started construction.

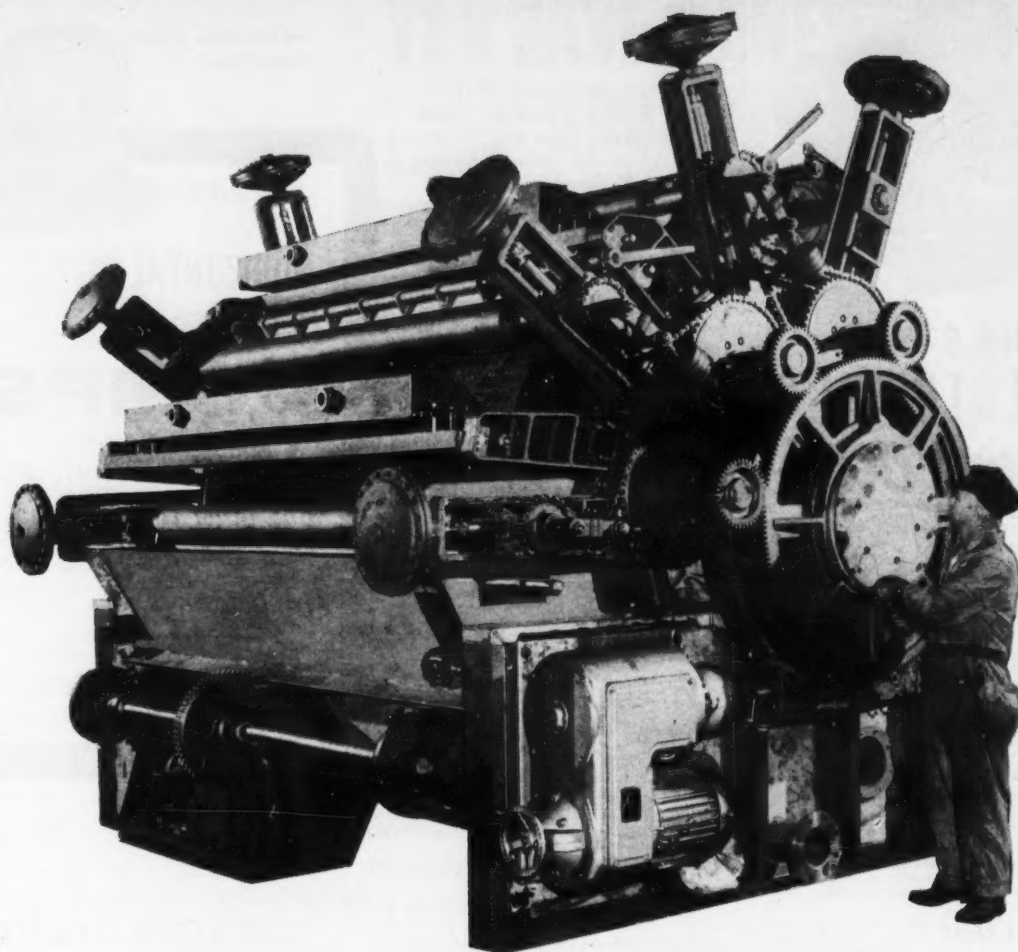
Hooker Chemical Corporation's Phosphorous Division is substantially expanding dicalcium phosphate production at its Columbia, Tenn., plant, where company operates two electric furnaces producing phosphorous from its own phosphate rock reserves. Enlarged facilities are expected to be in operation by April 1.

Commercial Solvents Corporation has more than doubled capacity of its methylamine plant at Terre Haute, Ind., by modifying process. New process is continuous, completely instrumented and automatically controlled. Detailed engineering and construction contracting was handled by company's engineering department.

Continental Carbon Company will expand its carbon black plant at Ponca City, Okla., to raise capacity from 50 million lb to 75 million lb annually of oil furnace blacks. Construction is expected to be completed by autumn. Distribution of entire production is through Witco Chemical Company, Inc.

Hercules Powder Company announces that commercial production of urea has begun at its new plant at Hercules, Calif. Plant has capacity of 20,000 tons annually, of which 75 percent will be for agricultural use. Remainder will be used largely in manufacture of urea-formaldehyde resins required by plywood and particle-board industry. A feed-grade urea also will be available for cattle feeds.

B. F. Goodrich Company announces production has started in new \$2.5 million plant for manufacture of ad-



GOING TO MARS

Someday, it may take products of a machine of this type to make the trip to Mars successful. Today, it is but a typical example of a specialized custom filter. It is a product of the extensive Eimco filter shops where the design and construction of filtration equipment is a science.

The picture shows an 8 foot diameter by 8

foot face bi-carb type drum filter with pressure rolls. It is a repeat order from a customer who has proved that he can lower his costs and increase his efficiency by specifying Eimco equipment for all of the needs in filtration, sedimentation and clarification. Call for an Eimco Sales Engineer to give you full details.

THE EIMCO CORPORATION

SALT LAKE CITY, UTAH

Research and Development Division, Palatine, Illinois

Export Offices: Eimco Building, 51-53 South Street, New York 5, N. Y.

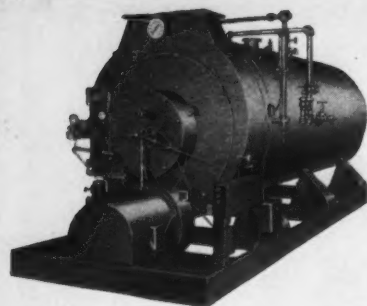
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD.

Process Engineers Inc. Division, San Mateo, California



B-385

Check 3151 opposite last page



Here's CYCLOTHERM'S 3-WAY CUT in STEAM PROCESSING COSTS!

If you process by steam, use steam by Cyclotherm. You cut costs in these three vital ways:

FUEL COSTS

Cyclotherm Cyclonic Combustion means just what it says—controlled fuel and air, whirling at 200 mph, forming a cyclone in the furnace! This high velocity burning assures maximum efficiency in combustion and heat transfer, resulting in lower fuel consumption.

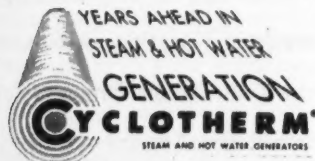
MANPOWER COSTS

A fire without a fireman! Electronic controls operate the Cyclotherm safely and automatically. Smaller models cycle on and off as steam is required. On larger models, precision modulation coordinates the fuel-air ratio to the load demand, from 30% to 100% of rated capacity.

INSTALLATION AND MAINTENANCE COSTS

Cyclotherm is factory assembled and factory pre-tested. All you do is make five simple connections. 50% maintenance savings are not uncommon. Return tubes cleaned in minutes with no removal or replacement of refractories. No standby unit needed.

And remember—one-third smaller than ordinary generators of similar capacity, a Cyclotherm fits almost anywhere. Many plants have installed two Cyclotherms for utmost flexibility and power. Burns gas or oil with quick changeover. 18 to 500 hp, 15 to 200 psi.



Cyclotherm Division,
National-U. S. Radiator Corp.
61 E. First St., Oswego, N. Y.
Please send me a free copy of your booklet
giving full information on Cyclotherm Steam
and Hot Water Generators.

Name _____
Company _____
Address _____
City _____ Zone _____ State _____

Check 3152 opposite last page

CHEMICAL BUSINESS

hesives. Streamlined two-story facility contains 70,000 sq ft of floor space and houses a development laboratory in addition to production units.

U. B. S. Chemical Corporation reports construction is scheduled to begin soon on manufacturing facilities for some of its newer chemicals. Company, which manufactures polymer chemical products, has signed a lease at Massachusetts Industrial Center, Marlborough.

HEF, Inc. expects full scale production will begin next month at its new ammonium perchlorate plant near Columbus, Miss., built on property adjacent to Hooker Chemical Corporation's sodium chlorate manufacturing plant. Approximate initial capacity will be 4 million pounds per year. HEF, Inc. is jointly owned by Hooker and Foote Mineral Company.

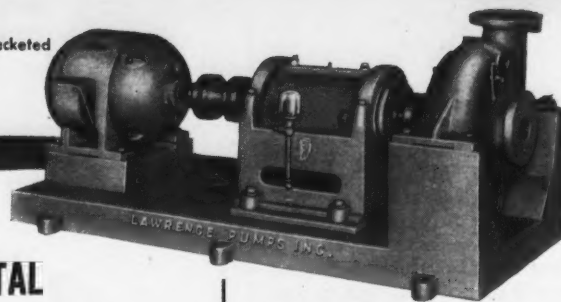
Radioisotope shipments — Oak Ridge tally

Total of 1118 shipments of radioisotopes amounting to 14,300,018 millicuries were made from Oak Ridge National Laboratory during October 1958. Through October, 12,054 radioisotope shipments amounting to 193,769,845 millicuries were made from the installation for calendar year 1958.

AEC approves export of power reactor

First license for export of a U. S. manufactured nuclear power reactor has been issued by the AEC. The license, dated November 6, 1958, authorizes shipment of the reactor to Belgium for installation at the nuclear development center at Mol, about 30 miles east of Antwerp. All major components are expected to be shipped by March 1959. Total value of shipment is estimated to be \$4 million. Unit will produce 11,500 kw of electricity.

Lawrence Steam Jacketed
Chemical Pump.



HORIZONTAL JACKETED PUMPS

*for sulphur, resins, waxes
and other liquids which
tend to solidify at low
temperatures.*

- Heavy duty, water cooled bearings
- Casing supported along center line of shaft to prevent misalignment or distortion from thermal expansion.
- Heating spaces vented, self draining.
- Heating medium: steam, dewatering, etc.

Write for Bulletin 203-7.

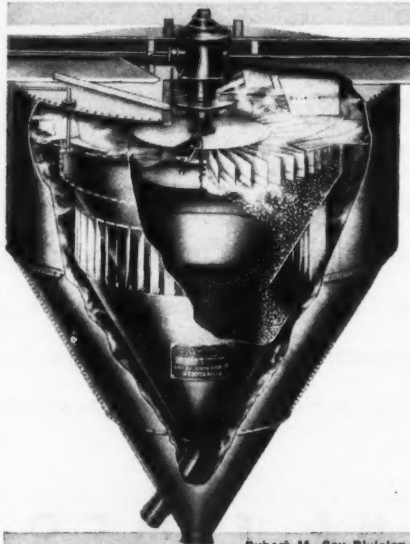
LAWRENCE PUMPS, INC.

371 Market Street, Lawrence, Mass.



Check 3153 opposite last page

USING SCREEN SEPARATIONS? NOTHING CLASSIFIES AS PERFECTLY AS AIR



UNIVERSAL ROAD MACHINERY CO.

117 Liberty St., New York 6, N. Y.

Factory and Laboratory: Kingston, N. Y.
In Canada: Watson-Jack Hopkins Ltd., Montreal

GAYCO CENTRIFUGAL AIR SEPARATORS

Classify practically all
dry fine materials

You get:

- CLOSER SEPARATIONS
- IMPROVED PRODUCTION
- NO UNDESIRABLE OVERSIZE.
- RANGE 60 to 400 mesh.
- Timken bearings.
- Choice of Standard or Heavy-Duty Models.

FORMULAS
APPLICABLE TO
AIR
SEPARATION

this
helpful
booklet
sent
on
request

Check 3154 opposite last page

CHEMICAL PROCESSING

Chemical Stocks' Earnings Gains Look Better As New Year Opens

WILLIAM R. WHITE, Market Analyst
Hornblower & Weeks

Prospects are materially brighter for the chemical processing industry as the new year begins. Optimism is based primarily on the resurgence in industrial activity, especially in steel and motor cars, which developed late in 1958. Improved demand for synthetic fibers also provides an important stimulant.

Outlook for profit margins seems somewhat less promising than for sales, it is true, but financial results should register modest gains in the year ahead. Stockholders find assurance in better plant efficiency, in firmer price trends despite excessive capacity, and in indications of reduced amortization charges.

Benefiting from operating economies and expanding consumer demand in recent months, representative companies experienced more satisfactory results for 1958 than had seemed possible only a few months ago. Industry sales are estimated to have approached the \$23.43 billion record achieved in 1957. Any decline from that total probably was negligible.

Efficiency Improved

As shipments turned downward a year ago in reflecting the recession, managements concentrated on improving manufacturing efficiency. Vigorous measures were adopted in trimming administrative, production, and distribution costs. Progress in this direction seems certain to carry over into 1959.

Promise of more impressive earnings gains in 1959 helps explain revival of a confident investment attitude toward this once highly popular growth stock group. Perhaps typical of the cheerful prospect is Dow Chemical's comeback. Management was pleased to raise its 1959 earnings sights recently.

Higher Profit Seen

Even though the company has been unable to attain a degree of plant efficiency considered desirable because new facilities recently have been

coming onstream, it seems apparent that net profit for the fiscal year ending May 31, 1959, is likely to range comfortably above the \$1.78 a share reported for fiscal 1958. Earnings for the first six months through November are believed to have approximated \$1 a share against \$1.12 a year earlier.

Although Dow's broad line of products is counted in excess of 700 different chemical items, chief emphasis recently has been placed on materials used in plastics. This group has developed strong growth tendencies. Sales volume has mounted steadily from year to year and seems headed for another peak in 1959. Capacity has expanded to an estimated \$1 billion annually. The indicated goal still remains some distance in the future.

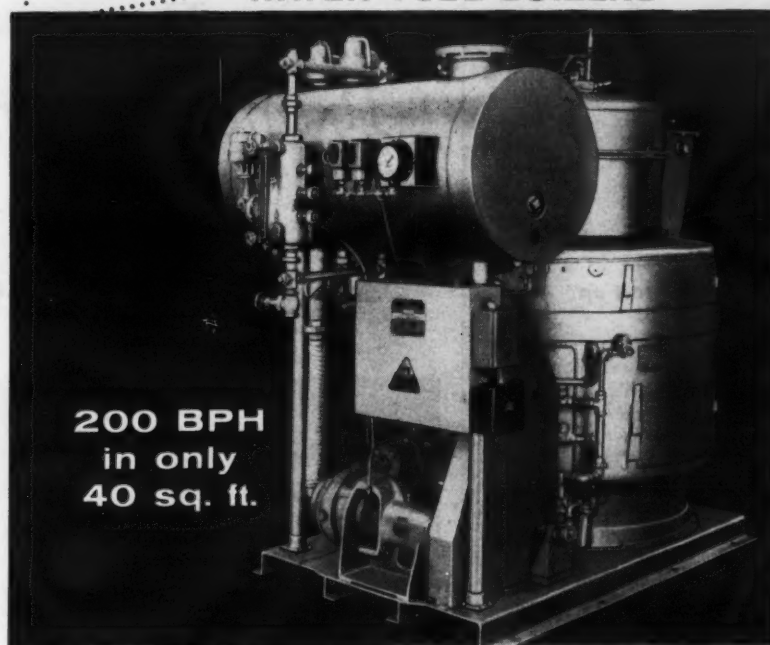
A recovery in earning power to within striking distance of the 1955 top at \$2.52 a share could be reached in another year or two if progress continues at the current rate. Dividends are being paid at the rate of \$1.20 a share, and cash distributions have been supplemented in almost every year for some time by payments in stock. Dow shares long have been among the most popular holdings of institutional investors.

(For further information on chemical stocks write Hornblower & Weeks, 40 Wall St., New York 5, N. Y.)

Check 3155 opposite last page.

YOU SAVE MONEY 5 WAYS DRUM MODULATIC WATER-TUBE BOILERS

WITH THE NEW
VAPOR



200 BPH
in only
40 sq. ft.

"WORLD'S MOST COMPACT HEAT AND POWER PACKAGE"

YOU SAVE

expensive plant space. Compact, efficient; take only one-fourth the space required for other boilers of comparable ratings. Fit anywhere—unused corners, aisles, on balconies; largest size takes only 5' x 8' floor space.

YOU SAVE

on installation costs. Delivered completely assembled and wired; need no special foundations, no forced-draft chimney. Fit through plant doors—wall removal unnecessary. Can be installed and operating in hours.

YOU SAVE

on operating economies. Completely automatic—supply "push-button" steam quietly, efficiently, economically. Feature "cotton-soft" 15-second start. Delivers instant hot water, or full steam pressure in 5 minutes from cold start. Burns oil, gas, or both.

YOU SAVE

on maintenance. Water tubes are so arranged that they make up multipass fire tubes . . . to combine the effectiveness of both types of construction without the disadvantages of either. No impingement stresses—no tube sheets to repair or replace.

Entire unit is covered by 1-year materials and workmanship warranty. 5-year tube warranty includes \$50 labor allowance.

YOU SAVE

because of Vapor Drum Modulatic flexibility. Multiple-unit installations meet widely-varying steam or hot-water requirements. Single, coordinating control turns individual units off or on as demand varies—ends the inefficiency of idling larger boilers. (Controls are standard with easily maintained or replaceable parts.) Unit sizes: 20 to 200 hp; 0-15, 5-150 psi steam pressure; 670,000 to 6,690,000 btu/hr; unlimited hot water. (Heavy duty Modulatics are also available in 9 sizes with pressures to 1000 psi.)

DEFERRED PAYMENT PLANS AVAILABLE IF YOUR CASH HAS OTHER WORK TO DO

VAPOR HEATING CORPORATION

Dept. 3-A,
80 East Jackson Boulevard
Chicago 4, Illinois

Send me free literature: ☐ Drum Modulatic Bulletin 475; ☐ Modulatics for pressures to 1000 psi, Bulletin 586; ☐ Extended Payment Terms Bulletin 486; ☐ Hydrolatic Hot Water Boiler Bulletin 490.

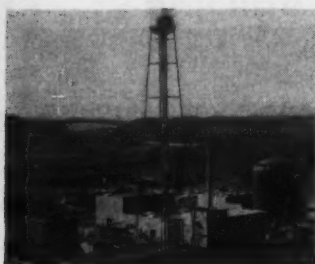
Name _____
Address _____
City, Zone, State _____

Check 3156 opposite last page



nuclear notes

Significant news about
atomic energy



**WTR set to start up
in May 1959**

Work is almost completed on Westinghouse's Testing Reactor (WTR) at Waltz Mill, Pa. Scheduled to go into operation in May 1959, the 20,000 kw (heat) reactor's primary purpose will be to subject materials and nuclear fuels to radiation conditions similar to those encountered in an operating power reactor. It may also be used for limited production of radioisotopes.

Nuclear program approved by U. S. — EURATOM

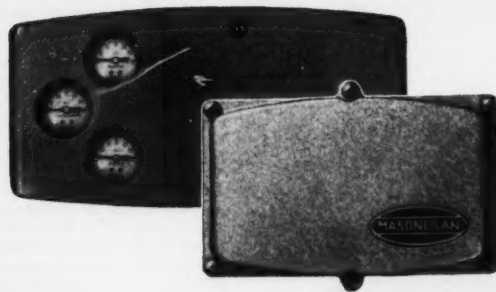
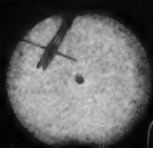
Agreement for Cooperation in civil uses of atomic energy between U.S. and the six-nation European Atomic Energy Community (EURATOM) has been signed. Major objective is to bring into operation in next five to seven years, one million electrical kw of nuclear power capacity, using reactor types developed in U.S. Capital cost of program, exclusive of fuel, is expected to be \$350 million.

Firm completes contract for 5000 fuel elements

Completion and deliveries of more than 5000 fuel elements for the refueling of research reactor at Brookhaven National Laboratory, Upton, L. I., has been announced by Sylvania-Corning Nuclear Corp. Deliveries were made under contract for more than \$250,000. Contract called for

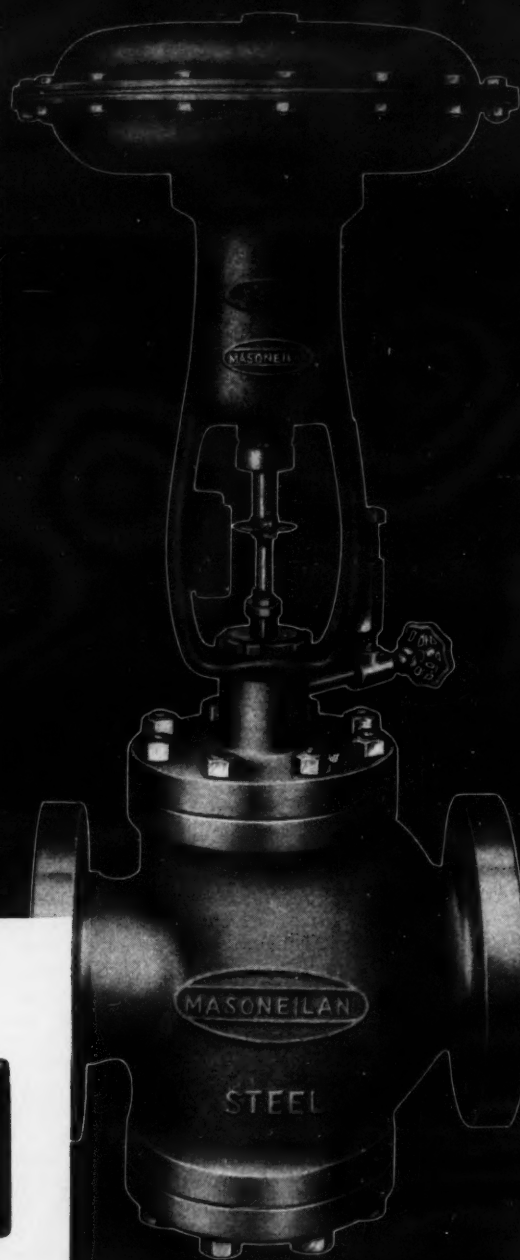
From Primary Element to Final Control Element...

From transmitter
and controller...



Through positioner and/or transducer...

To control valve



MASONEILAN

PNEUMATIC CONTROLS PROVIDE MAXIMUM SIMPLICITY AND DEPENDABILITY

Complete selection of pneumatic control devices for control of flow, pressure, temperature and liquid level.

For over seventy-five years, Mason-Neilan has developed a constantly expanding line of pneumatic controls for simplifying and advancing power and process plant, and pipeline operations.

Now, from one source, you have a selection of proven pneumatic instrument and valve designs; plus a number of electric devices which make possible further improvements in automatic control. These have been developed

with the usual Mason-Neilan concern for dependability and long term efficiency.

Whatever your needs for equipment to control pressure, temperature, level or flow, call on Mason-Neilan. Examples of the major product groups in the Masoneilan line are shown here, and extensive assistance is available in selection and application.

For catalog information on Mason-Neilan Controls, write to:

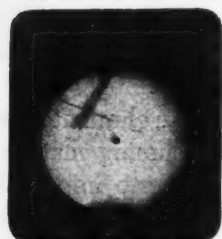
MASON-NEILAN

Division of Worthington Corporation

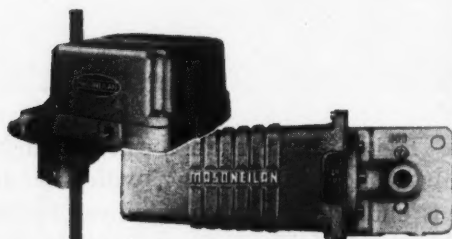
25 NAHATAN STREET, NORWOOD, MASS.

District offices or Distributors in principal cities in U.S.

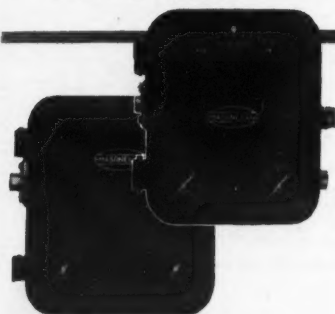
In Canada: Mason-Neilan Division of Worthington (Canada) 1955, Ltd.



Indicating, Recording and Controlling Instruments



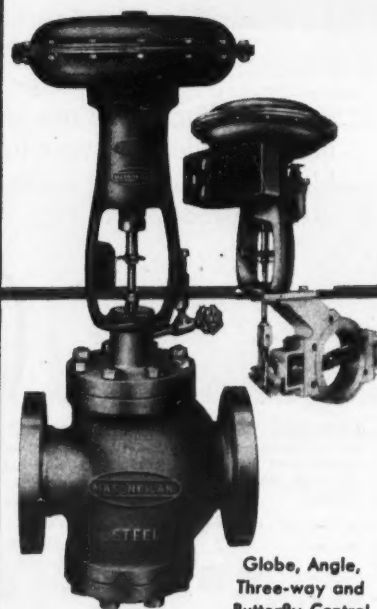
Pressure, Temperature, Flow and Level Transmitters



Non-Indicating Controllers



Liquid Level Controllers and Transmitters



Globe, Angle, Three-way and Butterfly Control Valves

Check 3157 opposite last page

change in basic type of element — converting from natural to enriched uranium to increase versatility of the reactor, an air-cooled graphite-moderated type.

(Further information about nuclear fuel elements may be obtained from Sylvania-Corning Nuclear Corp., Bayside, L.I., New York.)

Check 3158 opposite last page.

Uranium isotopic standards

The National Bureau of Standards in cooperation with the AEC has prepared first of a series of uranium isotopic standards. Ten standards became available October 1st. Weight percent U-235 for the individual standards are: 0.5, 1, 1.5, 2, 3, 5, 20, 85, 90, and 93.

Five additional standards will be ready in the near future. These will be at levels of 10, 15, 35, 75, and 80. A natural uranium chemical standard is also available.

Each isotopic standard issue unit consists of a quantity of uranium oxide (U_3O_8) equivalent to one gram of uranium. Chemical standard issue unit consists of 25 grams of uranium oxide. Charges vary from about \$18.00 to \$40.00 per issue unit depending on enrichment level.

Announce availability of thulium-170 sources

High specific activity thulium-170 sources are now commercially available. Made from thulium metal, units provide compact source of radiation. Being a soft gamma emitter, the thulium source requires only light-weight shields, making it a good tool for radiographical examination of light metals, thin sections, and for hidden components. Multicurie sources are available.

(Further information about thulium-170 sources may be obtained from Isotopes Specialties Company, Burbank, California.)

Check 3159 opposite last page.

NUCLEAR NOTES

Two-day symposium on fuel elements

First International Symposium on Nuclear Fuel Elements is scheduled to be held January 28-29, 1959, at Columbia University. Sponsored by Columbia University and the Sylvania-Corning Nuclear Corporation, invitations have been sent to ranking researchers and technological experts in the U.S., Canada, and the rest of the free world.

Status and Prospects of Nuclear Power

An objective review of the present status and future prospects for the production of electric power from nuclear fuels is given in a 52-page report. Although report is primarily directed to utility executives, it should also be of interest to engineers and those considering projects for the construction or operation of nuclear reactors for power production.

("Status and Prospects of Nuclear Power" may be obtained by submitting \$1.00 (\$2.50 for non-member companies) direct to Edison Electric Institute, 750 Third Avenue, New York, N. Y.)



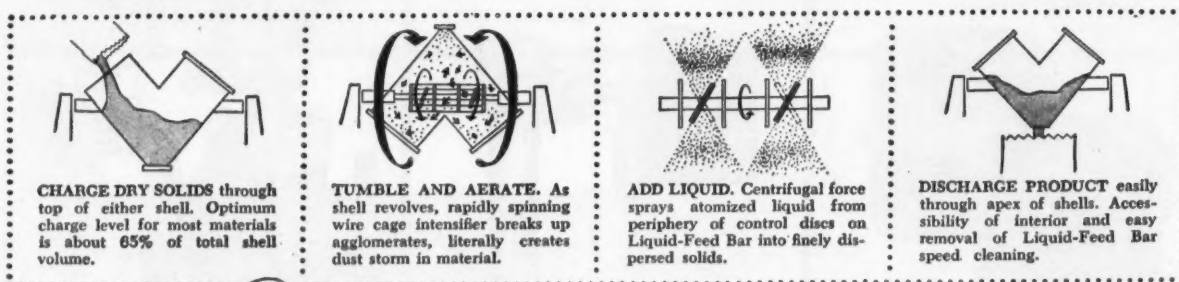
"Awright, awright — if you order a tank car we'll arrange to give you green stamps somehow!"

Blend

100 lbs. fine powder
and 8 oz. liquid
... in 15 minutes!

P-K "Twin-Shell" Liquid-Solids Blender easily and thoroughly disperses as little as 0.5% by weight of any liquid into dry solids. "Twin-Shell" does it in 15 minutes.

With the P-K "Twin-Shell" Blender the process industries can eliminate such post-blending operations as pulverizing and screening, with their time-consuming materials handling. Blending time itself is cut from hours to minutes. And some hitherto impossible blends are achieved easily with the P-K "Twin-Shell." Here's how "Twin-Shell's" unique design speeds processing:



See this new concept in blending! Accept this invitation... ➡ ➡

Get new ideas for your blending process at P-K's Pre-Test Lab

Phone Stroudsburg 820 and arrange
to make comparison tests — using
your own formulations — at
P-K's Pre-Test Lab.

P-K makes practically all kinds of blenders — conventional types as well as the radically different "Twin-Shell." Thus, P-K can give you impartial help in selecting the correct blending process for your needs.

But, blending is full of variables; don't decide on *any* blending equipment or process until you pre-test it with your own formulations. The Pre-Test Lab offers you an opportunity to do this with the aid of skilled blending technicians and proper equipment . . . and without obligation, of course.

You simply bring or send your materials to the Lab. Here the correct blending procedure and equipment for *your* job are determined by extensive tests. You receive a comprehensive report that can become the basis for an informed selection.

You're invited

to pre-test your own formulations at the Pre-Test Lab. Write — or better yet, phone — Russell Dotter at P-K to set a date. (The number: Stroudsburg 820.) He will tell you how much of your materials to bring and will give you other details.

If you can't spare the time, send your materials anyway. But try to see the tests for yourself. If your process includes precision blending, your visit will be worth your while. The Patterson-Kelley Co., Inc., 1801 Hanson St., East Stroudsburg, Pa. (in the heart of Pennsylvania's scenic Pocono Mountains).

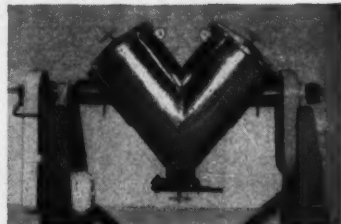
P-K Process Executive welcomes visitor to Pre-Test Lab at East Stroudsburg, Pa. Lab is equipped and staffed to make, or help you make, conclusive tests of blenders with your own materials.



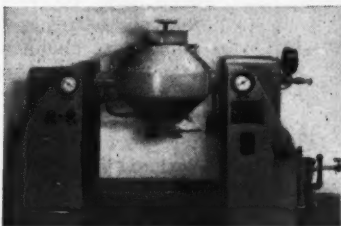
TEST YOUR MIX WITH EQUIPMENT LIKE THIS



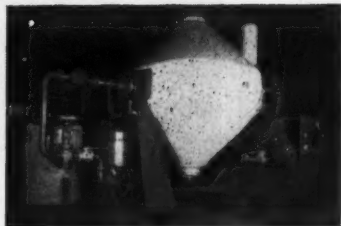
"Twin-Shell" Liquid-Solids laboratory models are made in transparent Lucite or stainless steel, in 8 and 16 quart sizes.



Production models of the "Twin-Shell" blender range up to 50 cu. ft. capacity. (Intensifier and Liquid-Feed Bar optional.)



Vacuum Tumble Dryers by Patterson-Kelley are available in sizes down to the standard 1 cu. ft. capacity lab model.



Production models of the Vacuum Tumble Dryers have capacities up to 150 cu. ft. Come factory aligned, piped, instrumented.

Patterson Kelley
Chemical and Process Division

Waste calcining facility construction started

The AEC has announced start of construction of pilot plant at its National Reactor Testing Station, Idaho, for calcining high-level radioactive liquid waste products.

Fluor Corporation's basic contract was amended to provide \$3,391,700 for construction of the plant, total cost of which will be about \$6 million. Plant is scheduled to be completed by January 1960. It will be capable of handling one gallon of waste per minute, and will provide prototype experience for full-scale plants.

Atom vulcanizing fine, but costs 10 times more

Only the harsh facts of economics keep us from riding on rubber tires vulcanized by atomic energy or walking on radiation vulcanized rubber heels. Speaking at a recent ACS meeting, Dale J. Harmon, The B. F. Goodrich Company Research Center, Brecksville, Ohio, said that amount of radiation exposure required costs about ten times as much as chemical curing. The laboratory has been vulcanizing rubber and rubber-like materials with results equal to or better than conventional chemical vulcanization.

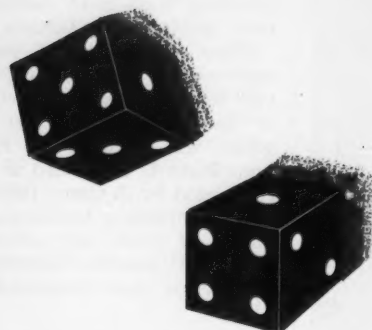
Tells use of radioisotopes in routine chemical analysis

First in series of technical bulletins explaining use of radioisotopes in routine chemical analysis is available. The literature outlines use of radioisotopes in yield determination, a common analytical problem. Proper procedures are outlined and answers to many common questions about use of radioisotopes are cited.

(Tech Bul #1 may be obtained from Nuclear-Chicago Corp., 229 West Erie Street, Chicago 10, Ill.)

Check 3161 opposite last page.

don't gamble



buy

HARRISBURG CYLINDERS

Why risk carrying high pressures in run-of-the-mill cylinders? For the same investment you can have the extra insurance of CYLINDER DESIGN proven by time and service. Harrisburg's design puts emphasis on both the cylinder's ability to contain high internal pressures, and to consistently withstand the shock and fatigue incurred during decades of rough handling.

Harrisburg's hot-drawing process permits the graduation of cylinder wall thickness to increase strength where it is needed most — at and around the cylinder base. And to insure positive gas-tight sealing, highly accurate ramp gauges are used to obtain precision neck threading on every cylinder.

Procedures such as these make Harrisburg cylinders the world's most dependable. Don't gamble. Buy quality. Buy Harrisburg.



More than a Century in Harrisburg 24, Pa.

H HARRISBURG STEEL CO.

Division of HARSCO CORPORATION



TUBES



TRANSPORTS



FLANGES



COUPLINGS

Check 3162 opposite last page



Watching Washington

Air Pollution Seen as Hot Topic With Congress Back to Work

As the first session of the new Congress convenes, observers here feel certain that one topic due for prominent airing will be that of air pollution and how best to prevent and abate it.

Last November's National Conference on Air Pollution, held in Washington, provides some clues not only to probable Congressional action but also to the course that may be followed at city and state levels.

The three-day parley, called by Surgeon General Leroy E. Burney, was attended by more than 900 representatives of federal, state, and city governments, industry, science, and medicine as well as some observers from civic groups.

The conference had at least two purposes: Holding a forum for a full exchange of ideas and presentation of information on subjects ranging from individual health to research needs and enforcement procedures; and firing the opening gun in a campaign to strengthen provisions and expand the scope of Public Law 159 (Air Pollution Control Act), scheduled to expire in 1960.

Industrial Scapegoat

Opening day at the conference saw representatives of four industries speak: Steel, petroleum, chemical, and automotive. The last-named wound up as the industrial scapegoat both on the meeting floor and in subsequent national news stories.

Generally, though, industry efforts to abate or prevent air pollution were recognized. For the first time, the issue of personal health was brought full scale into the problem. Physicians such as Philadelphia's director of health, Dr. James P. Dixon, and California's Dr. John R. Goldsmith said that substances which cause irritation of eyes, nose, and throat can be the same polluting

substances which can damage the lungs. Dr. Dixon said air pollutants may play a role in the increased number of deaths from cancer of the stomach, esophagus, and lungs.

The chemical processing industry fared well, with Du Pont's William R. Chalker pointing out that the nation's 12,000 chemical plants utilize 20 percent of all air pollution control equipment, and the industry spends 2.5 percent of its total new plant investment on air pollution control.

Dow's Dr. E. M. Adams said improved knowledge in the air pollution field will come from the combined work of industry, academic, and government groups. Some observers believe, however, a danger exists that too much research will fall into federal government hands, thus offering an opportunity for an unrealistic view of industry's needs.

General John E. Hull, Manufacturing Chemists' Association president, was senior chemical processing industry spokesman present. He characterized the industry as "one of the leading partners in solving the problem of air pollution."

Local Level Control

He discussed MCA's "Rational Approach to Air Pollution Legislation," which stresses that point of control of air pollution is at local or regional level, and that state or federal contributions should be in technical and administrative rather than control areas.

One thing is certain—with

increased public awareness of the air pollution problem and its dangers to health, any chemical processor who doesn't make certain that his air pollution skirts are clean will shortly be up against more than just a fine. Also, owners of existing plants which have had a long-term pollution problem should plan either to eliminate or control the problem within the next two or three years or look forward to finding themselves in an untenable position in their community.

As one speaker said: "The public-be-damned attitude of industry of another day is gone."

He might have added that if such an attitude exists, it will be attacked by increased controls, stronger legislation, and sharpened public censure.

Ethical drug industry probe seen in offing

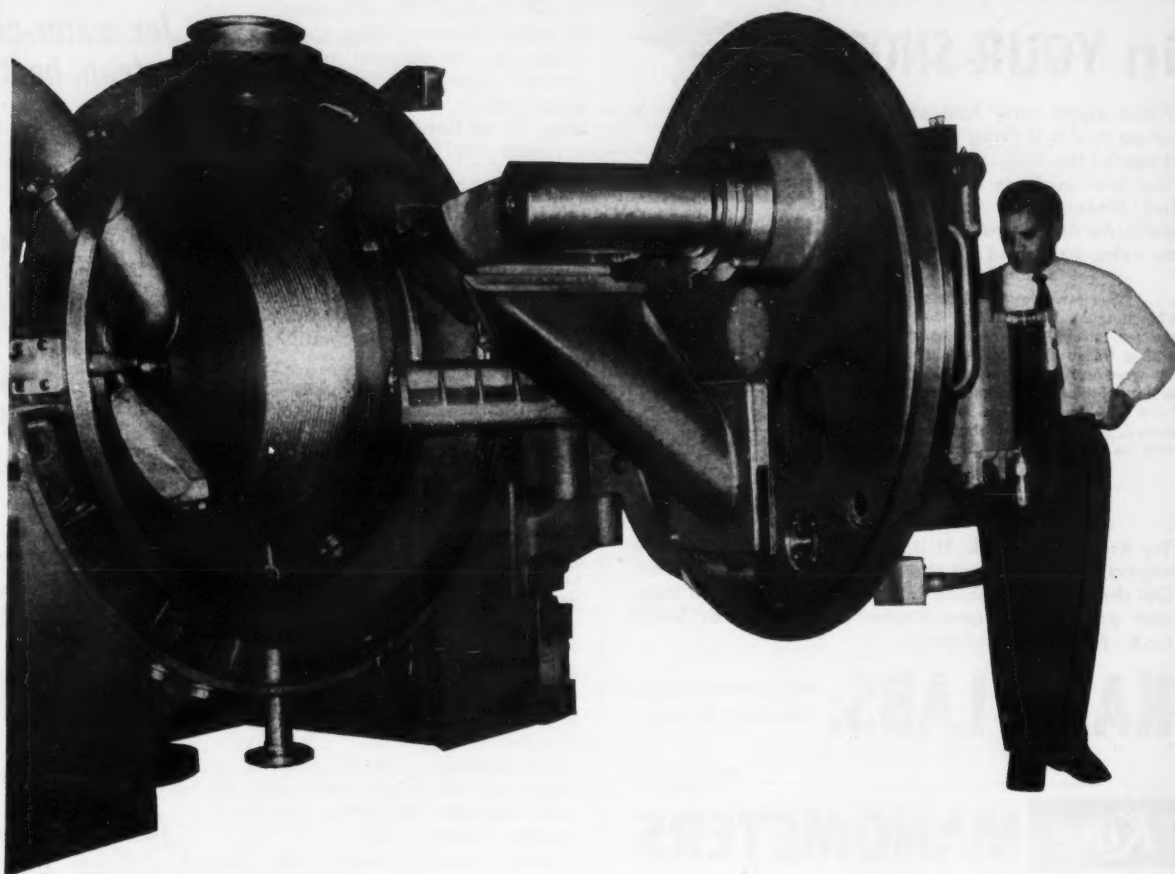
As predicted in previous columns, a major investigation of the ethical drug industry is in the wind this Congressional session. Launching the probe will be the Senate Anti-trust and Monopoly Sub-committee, which has conducted a running inquiry into what it calls "administered prices" in various industries.

Investigators plan to go further than last summer's Federal Trade Commission complaint against six leading drug manufacturers. Chances are, though, that the committee will lean heavily on the book-length report by the FTC.

Revised list of export controls released

The long-awaited revised export control list has been released by the Department of Commerce. Controls have been eased over a substantial number of commodities which formerly required individual

a new dimension in crystal dehydration



CAPACITIES OF THE NEW SHARPLES C-41 SUPER-D-HYDRATOR ON REPRESENTATIVE SLURRIES.

AMMONIUM SULFATE—a relatively large free-draining inorganic crystal . . .

20-24 tons/hour

"CAUSTIC SALT"—a relatively small, slower draining crystal requiring high efficiency rinsing . . .

13-16 tons/hour

POLYPROPYLENE—typical of extremely fine, slow draining, low bulk density organic solids . . .

1.0-2.5 tons/hour

The C-41 Super-D-Hydrator is the largest of 3 high efficiency crystal drying centrifuges by Sharples (C-20; C-27; C-41) which are designed for both atmospheric and pressurized operation, and are available in various standard materials of construction.

Sharples engineers have incorporated many innovations in the design of the new C-41, learned in over 40 years experience in the chemical industry, and are further prepared to give special design consideration to each specific problem. May we consult with you regarding your separation problems?



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Check 3163 opposite last page

BIGGEST THING in YOUR SHOP...

When some rusty bolt or shaft won't let go and it is tying up production... it can be the biggest thing in your shop. That is when Kano Kroil, the new chemical loosener, is worth its weight in gold. As one customer put it, "It's like an extra employee."

... "Five men, total weight of 825 pounds, using levers and sledges, struggled for an hour with a frozen shaft. No luck. So all went out for a smoke. One man, weighing 140 pounds used Kroil and by the time we returned, had lifted the shaft out with no leverage."



You Too Can Get This Result

Try Kroil at our risk. If it doesn't do more than you expect, return it and the charge will be cancelled. Get the Kroil combination, one gallon of Kroil (regular price \$4.00) and Kroil squirt gun for \$4.95 f.o.b. factory. Order direct.

KANO LABS.

1051 S. Thompson Lane
Nashville 11, Tennessee

Check 3164 opposite last page

King MANOMETERS

For Plant and Laboratory

King Manometers are rugged, low-cost instruments of unexcelled accuracy for measuring pressure, vacuum, differential pressure, and pressure-related phenomena. They're available in the following types, in a complete range of sizes:

U-Type Manometers

- Single Cleanout
- With 3-Valve
- Double Cleanout
- Manifold
- Inverted U-Type

Well-Type Manometers

- Low-Well
- Barometric-Reading
- Raised-Well
- Flowmeter Type
- Inclined-Tube

Multi-Tube Manometers

- Individual-Well
- Common-Well
- Photo-Manometers

NEW CATALOG 2008 gives details on these and other models — includes manometer liquids and accessories — explains basic principles. Write —



KING ENGINEERING CORP.
Box 270 • Ann Arbor, Mich.

REPRESENTATIVES IN PRINCIPAL CITIES

Check 3165 opposite last page

WASHINGTON NEWS

export licenses for shipment to most countries. Now these items can be shipped under general license to all countries outside the Sino-Soviet bloc, Hong Kong, and Macao.

Among 250 items removed from the department's "positive list" are many chemicals, rubber, paper and petroleum products, scientific instruments, ores, and metals.

Changes in the list also involve addition of some 80 new entries "reflecting scientific and technical progress." These include certain special kinds of synthetic rubber and metal products, electrical, construction and industrial machinery, and industrial chemicals.

Specific information on changes can be obtained by writing to the Department of Commerce and requesting Export Bulletin No. 806.

Meanwhile, it was revealed that applications for licenses to export antibiotics and related drugs to the European Soviet bloc now will be considered for approval.

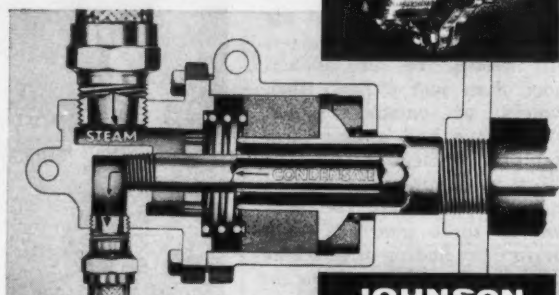
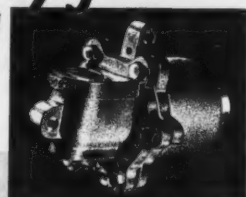
Commodities include penicillin, the "mycins," and all other similar antibiotics, including sulfanomides.

Until recently—except for research purposes and certain emergencies—applications to export these commodities to the European Soviet bloc generally were denied by the Department of Commerce.



Need a rotary joint?

... for water-cooled or steam-heated rolls...



Type SB illustrated is completely self-supporting. For fully engineering data write for Bulletin S-3002.

**JOHNSON
Rotary Pressure
JOINTS**

Johnson started the whole idea... is far ahead in know-how, available types and sizes. Johnson joints are completely packless, need no lubrication or adjustment. Used on dryer rolls, mills, waxers, calenders, slashers, printing presses, etc.—handling steam, water, hot heat transfer oils, Dowtherm, Monsanto Aroclors, etc. Actually serving under pressures as high as 2400 psi. Sizes up to 8".



THE JOHNSON CORPORATION
826 Wood St., Three Rivers, Michigan

Check 3166 opposite last page



LET US TAKE YOUR
NOISE AND PULSATION PROBLEMS
OFF YOUR HANDS

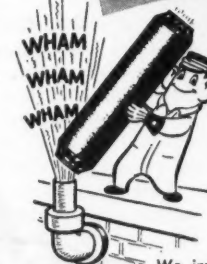
It is our
engineering
specialty to

STOP PULSATION

—from surges created by compressors, pumps, blowers and pressure reduction systems.

STOP NOISE

—from intake or discharge of air, steam or gas from engines, compressors and vacuum systems.



The Burgess-Manning Snubbing Principle, engineered to your specific problems, will provide noteworthy savings in operating and installation costs, increased production, reduced maintenance, improved public and employee relations and prevention of compensation claims.

We invite you to present your problems for recommendations.



BURGESS-MANNING COMPANY

Sound Engineering 9231 Sovereign Row, Dallas 35, Texas
Libertyville, Illinois

Check 3167 opposite last page

CHEMICAL PROCESSING



new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services. Additional reviews of catalogs, bulletins, data sheet, etc., are found throughout other sections of this magazine

Fertilizer flowsheet—Six-page bulletin contains an illustrated flow-sheet, showing how various types of fertilizers are made from ammonia and other materials. Information is given on the increasing consumption of nitrogen fertilizers in the world. "Nitrogen"—The Chemical & Industrial Corporation, Cincinnati 26, Ohio. Check 3168 opposite last page.

Plastic molds and die bases, standard and special nested, are cataloged and priced in ten-page publication that covers all possible types of bases of interest to the plastic molding industry. Cat and price chart — Columbia Engineering Co., Inc., 113-119 Sussex Ave., Newark 3, N. J.

Check 3169 opposite last page.

Respiratory protection offered to industrial workers in atmospheres containing gas, dust, heat, and fumes is described in manufacturer's six-page brochure. Respirator units can be connected to high-pressure air cylinders or plant air supply systems. "Scott Demand Class Respirators" — Scott Aviation Corporation, 8346 Erie St., Lancaster, N. Y.

Check 3170 opposite last page.

Oil filters for filtration of various types of industrial oils, fuel oil, solvents, coolants, etc., used in manufacturing and chemical process industries are covered in bulletin that includes data table for proper filter selection. Oil Filter bul — Purifier Div., The Hilliard Corporation, West Fourth St., Elmira, N. Y.

Check 3171 opposite last page.

Laboratory catalog — of 175 pages illustrates and describes more than 450 different instruments and apparatus. Included are valves, ovens, petroleum test equipment, humidity indicators. 1959 catalog — Labline, Inc., 3070 W. Grand Ave., Chicago 22, Illinois.

Check 3172 opposite last page.

Preservatives — Uses, physical properties and technical grades of sodium benzoate and benzoic acid are detailed in eight-page booklet. Among uses described are for food, beverage, pharmaceutical, cosmetics, dyes and chemicals fields. Bul-323 — Hooker Chemical Corporation, Box 344, Niagara Falls, N. Y.

Check 3173 opposite last page.

Laboratory oven — with "circle-of-heat" design is described in one-page bul. Oven is said to have no cold corners. Bul 458 — Hevi-Duty Electric Co., Milwaukee 1, Wisconsin.

Check 3174 opposite last page.

Chemical-resistant finish tests on synthetic fabrics are described in manufacturer's four-page bulletin, which includes complete technical data concerning results. "The Chemical Resistance of Astonized Finish on Synthetic Fabrics" — Onyx Oil & Chemical Company, Jersey City 2, N. J.

Check 3175 opposite last page.

Annunciator featuring lower installation cost, flashing sequence alarm, and no-drain-circuit for monitoring complex automatic equipment from 24 to 96 points is described in Bul 103 — Panel-lit, Inc., 7401 N. Hamlin Ave., Skokie, Ill.

Check 3176 opposite last page.

Pneumatic conveyor for handling fine granular and dry pulverized materials is described in four-page illustrated bulletin that points out features and shows various applications. Bul 401 — The Robinson Air-Activated Conveyor Systems Div., Morse Boulevard Destructor Co., 80 West Fifth Ave., New York 11, N. Y.

Check 3177 opposite last page.

Naphthenic acids, three grades, are detailed in technical bulletin that gives information on properties, specifications, applications, and shipping. Tech Bul 24 — Sun Oil Company, Industrial Products Department, 1608 Walnut St., Philadelphia 3, Pa.

Check 3178 opposite last page.

Storage rack pictorial presentation of six pages shows many uses to which adjustable racks are being put in industry. Assembly of racks is also illustrated. Storage rack bul — Palmer-Shile Co., 16016 Fullerton, Detroit 27, Mich.

Check 3179 opposite last page.

Electric heat advantages for plating baths are discussed in four-page bulletin which gives tips on proper heater selection, installation, power, and maintenance. Bul GER-1333 — General Electric Company, Schenectady 5, N. Y.

Check 3180 opposite last page.

Reclaimed containers are crimped and cut by equipment described in six-page bulletin, to make pliable crimped corrugated sheet. Many dollars can be saved by converting normally wasted heavyweight shipping cartons into versatile, flexible wrapping and packing material. Literature pictures equipment, shows how it can be used. "Comptopak Packing Program" — Comptopak Division, Comptometer Corporation, 1735 N. Paulina St., Chicago 22, Ill.

Check 3181 opposite last page.

Digital indicators and transducer pickups are illustrated in four-page, two-color bulletin. Applications include measurement of weight, flow, pressure, temperature. Bul 1758 — Performance Measurements Co., 15301 W. McNichols, Detroit, Mich.

Check 3182 opposite last page.

Moisture determination in paper-board pulp, both unbleached sulfite and semi-kraft, by nuclear magnetic analyzer is detailed in Report 1.58 — Ridgefield Instrumentation Div., Schlumberger Well Surveying Corp., Ridgefield, Connecticut.

Check 3183 opposite last page.

Drives which provide adjustable machine speed from in-plant AC circuits are described in 16-page illustrated bulletin. Condensed drive specifications, dimensions, and accessories are provided in Bul D-2506 — Reliance Electric and Engineering Company, 24701 Euclid Ave., Cleveland 17, Ohio.

Check 3184 opposite last page.

High polymeric plasticizer of maximum permanence and stability is detailed in four-page bulletin. Specifications, outstanding characteristics, major uses, physical properties, and test data are included in Bul TP-7-H — Harchem Div., Wallace & Tiernan, Inc., 25 Main St., Belleville 9, N. J.

Check 3185 opposite last page.

Inert gas producers are described in bulletin (I-106) which provides information on 500- and 1000-cfh panel-enclosed unit. Another bulletin (I-107) gives data on line of purge producers designed for use where inerts are needed for blanketing, purging, and protective purposes. Buls I-106 and I-107 — C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore 2, Md.

Check 3186 opposite last page.

Propeller meters for water and other fluids are described in 20-page bulletin. Some principles of propeller metering, with performance graphs of each type, are given. Bul 314-1 — Sparling Meter Co., 225 North Temple City Blvd., El Monte, Calif.

Check 3187 opposite last page.

Reinforced Fiberglas brochure of six pages contains information on performance and dimensions, as well as a thorough resume of advantages of reinforced Fiberglas application to power roof exhausters. Bul DC 2-6 — The Galaher Company, 4108 Dodge St., Omaha 31, Neb.

Check 3188 opposite last page.

Steam jets that withstand corrosion, and which are used for heating, circulation, agitation, and digestion, are detailed in 12-page bulletin. Selection data, specifications, and dimensions are provided in Bul M/5 — The Duriron Company, Inc., Dayton, Ohio.

Check 3189 opposite last page.

Metal-ceramics — Booklet of 12 pages contains physical, mechanical, and chemical properties, and typical applications of metal-ceramics. Materials are now in use at temperatures to 2800°F. Metal-ceramics Bul — Haynes Stellite Co., Div. of Union Carbide Corporation, Kokomo, Ind.

Check 3190 opposite last page.

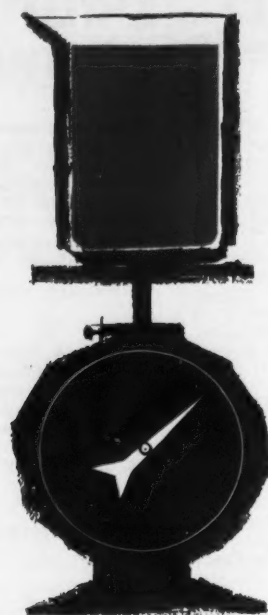
Control system, for instant formula changeover is described in bulletin which explains how control is used with weighing systems to complete automation on batching and mixing operations. How control system simplifies record-keeping, protects secrecy of formulas, and maintains continuous production is also described. Bul NP-1 — Richardson Scale Co., Van Houten Ave., Clifton, N. J.

Check 3191 opposite last page.

Solvents guide of eight pages provides information and specifications on aliphatic naphthas, paraffinic hydrocarbons, and aromatic hydrocarbons. Complete line of petroleum solvents is presented in chart form with specifications showing relative time of evaporation. Another chart lists individual solvents and their principal industrial uses. "Amsco Solvents" — American Mineral Spirits Co., Murray Hill, N. J.

Check 3192 opposite last page.

more pounds per gallon

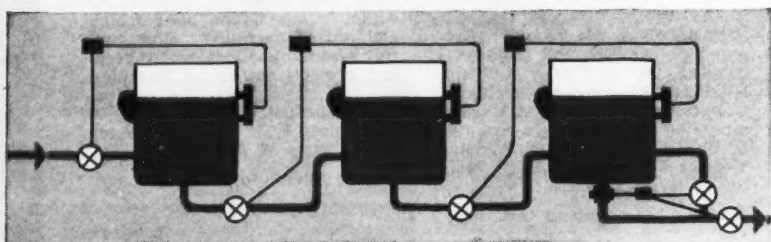


AccuRay. MULTI-EFFECT EVAPORATOR CONTROL SYSTEM

Only an AccuRay Continuous Process Analyzer and Level Control System senses density and level independent of other product characteristics. More pounds per gallon are obtained by minimizing process variable spread. The AccuRay Process Analyzer, external to the process, continuously measures total solids in both solutions and slurries to accuracies of ± 0.001 specific gravity. The AccuRay Level Control System maintains liquid level to $\pm 1/8$ of an inch.

In the diagram of a forward feed evaporator system shown below, a level control system on the exterior wall of each evaporator maintains constant solution level. The Density Control System on the last effect maintains crystallized product at the highest possible pounds per gallon, with minimum fuel cost.

Let AccuRay work for you . . . write today for complete information



Industrial Nucleonics

CORPORATION

1157 Chesapeake Ave. • Columbus 12, Ohio

The WORLD'S LARGEST Manufacturer of Nucleonic Industrial Process Control Systems

Check 3193 opposite last page

NEW LITERATURE

Resins for wet strength paper, their chemical and physical properties, their stability, and storage and handling requirements are discussed in 24-page booklet. Recommended operating practices in manufacturing wet strength paper are covered in detail. "Uformite Resins for Wet Strength Paper" — Resinous Products Division, Rohm & Haas Company, Washington Square, Philadelphia 5, Pa.

Check 3194 opposite last page.

Dust collector, wet-inertial type, installed as part of duct is detailed in 12-page bulletin. Unit, according to manufacturer, is only one-tenth size of other collectors of comparable performance, and has efficiency of 95% of all dust 5 microns in size and 80% of dusts in the 1 micron range. Bul J-616 — Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.

Check 3195 opposite last page.

Pressure transducers, based on unbonded strain wire principle, are described in four-page bulletin. Also included are circuit diagrams, a typical installation, and explanation of operation of equipment. Bul Series PSG-1 — Gulton Instrumentation Div., Gulton Industries, Inc., 212 Durham Ave., Metuchen, N. J.

Check 3196 opposite last page.

Pneumatic bulk trucks for handling of chemical and industrial materials are described and illustrated in four-page bulletin that includes a diagrammatic presentation of "on-board" air system. Advantages of bulk handling and specific information on possible cost savings are included. Bul 205 — Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

Check 3197 opposite last page.

Soap and detergent buying guide lists more than 40 of manufacturer's products. Handy pocket-size, 36-page guide provides information on various uses of product, special properties, and details as to sizes, weights, and packaging. Soap-Detergent Buying Guide — Associated Products Department, Colgate-Palmolive Company, 300 Park Ave., New York 22, N. Y.

Check 3198 opposite last page.

Pre-test laboratory which helps determine proper blending equipment and correct blending procedures is covered in 16-page bulletin which describes organization and operation. Descriptions and specifications on line of blenders, vacuum tumble dryers, packaged resin-distillation pilot plants, and process heat exchangers are also provided. Easy-to-read tables on simplified diagrams are featured in Bul 16 — The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.

Check 3199 opposite last page.

Specialty inks for industrial marking are described in six-page catalog which discusses various characteristics such as drying speed, adhesion, durability, color, and special properties. Specialty inks cat — Markem Machine Co., Keene 56, N. H.

Check 3200 opposite last page.

Catalytic combustion kit — to adapt chromatographic analyzers to catalytic combustion detection is described in two-page bul. Tech bul 905 — Davis Instrument Div., Davis Emergency Equipment Co., Inc., 45 Halleck Street, Newark 4, New Jersey.

Check 3201 opposite last page.

Bulk material vibrators — Catalog of 64 pages lists vibratory bulk material handling equipment including vibrators, packers, jolters, car rappers, feeders, conveyors, and weigh-feed equipment. Illustrations, descriptions, and specifications of all equipment are provided in Cat 586 — Syntrol Co., 110 Lexington Ave., Homer City, Pa.

Check 3202 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Iron ore treatment process is described in 12-page brochure that includes many informative illustrations and charts. Process produces metallic iron briquettes which may be fed directly to electric, open hearth, or blast furnace. "The R-N Direct Reduction and Beneficiating Process" — R-N Corporation, Room 1400, 111 Broadway, New York 6, N. Y.

Ion-exchange resin data sheet covers specially refined analytical grade materials. Lists for tabulation of resin considerations and general properties, and a selected bibliography of books and reviews are contained in four-page publication which also specifies prices for small and large quantities. Price List "M" — Bio-Rad Laboratories, 32nd and Griffin Ave., Richmond, Calif.

Check 3203 opposite last page.

Open floor grating and stair treads available from steel products manufacturer are shown in 16-page catalog. Engineering details, from panel sizes, weights, and safe loads, to surface treatments and fastening methods are included. Cat RSL-5 — Reliance Steel Products Co., PO Box 510, McKeesport, Pa.

Check 3204 opposite last page.

CHEMICAL PROCESSING

Extreme water purity requirements in nuclear cycles, including considerations of efficient heat transfer, radioactivity, corrosion, materials of cycle construction, and fuel element fracture are discussed in four-page Tech Reprint T-162 — Graver Water Conditioning Co., Division of Union Tank Car Company, 216 West 14th St., New York 11, N. Y.

Check 3205 opposite last page.

Pigment dispersion method in paints, plastics, and rubber through use of cationic agents are covered in 16-page booklet which shows how pigments may be economically treated to produce improved products and savings to manufacturers. "Pigment Dispersion with Aliphatic Chemicals" — Chemical Division, Armour and Company, 1355 West 31st St., Chicago 9, Ill.

Check 3206 opposite last page.

Group relamping booklet contains information applicable to industrial plants, offices, and wherever large numbers of lamps are used. It costs just as much to operate a dimmed-out lamp as it does to operate a new one according to the data provided in this 16-page booklet. Group relamping booklet — General Electric Company, Dept. RL-58, Inquiry Bureau, Nela Park, Cleveland 12, Ohio.

Check 3207 opposite last page.

Electroplating filtration, and how to improve tank turnover, are explained in four-page, three-color booklet on manufacturer's filters with honeycomb filter tubes. Bul GEO-508 — Commercial Filters Corp., Melrose, Mass.

Check 3208 opposite last page.

Four-wheel freight carts with removable and replaceable hardwood decks are described in four-page circular. Operating and design features are provided as well as information on how to replace decks on carts, which have 2000-lb capacity. Circular 29-E — Lewis-Shepard Products Inc., Dept. R8-20, 125 Walnut St., Watertown 72, Mass.

Check 3209 opposite last page.

High-frequency equipment value as a means of increasing output or efficiency of present-day high production machinery is pointed out in 12-page bulletin. Application and engineering information is presented on two types of high frequency power supplies. Basic differences in these two high frequency sources are discussed, and their capabilities for constant and adjustable speed are outlined. Bul 2250 — The Louis Allis Co., 427 East Stewart Street, Milwaukee 1, Wisconsin.

Check 3210 opposite last page.

Durable answer to you who have asked for a husky sectional belt conveyor



ANSWERS STORAGE PROBLEM — Using Link-Belt Pre-Bilt belt conveyors to stockpile material 40 feet high, this efficient layout using a radial belt stacker has overcome the restrictions of limited area. System has to operate continuously up to 60 hours, or more.

LINK-BELT Pre-Bilt Belt conveyors handle up to 1500 tons per hour

Per pound of weight, no other sectional belt conveyor tops the strength and rigidity of Link-Belt Pre-Bilt Sectional Belt Conveyors.

For full information on these durable conveyors up to 36 in. wide—with drives up to 40 hp, 24 and 42-inch truss depths or simple channel stringer type—contact your nearby Link-Belt office.



BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World.

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From selection to erection . . . you save every step of the way with quality pre-engineered equipment

NO DETAILED DRAWINGS—From standardized data, a Link-Belt engineer will prepare an "on-the-site" quotation covering the components for your needs.

LOWER PURCHASING COSTS—Interchangeability and standardization reduce costs and speed selection of parts . . . all available from Link-Belt.

NO COSTLY DELIVERY DELAYS—PRE-BILT conveyors are built at eight strategic locations and are shipped from the plant nearest you to assure prompt delivery.

QUICK LOW-COST INSTALLATION—Simple construction and shop-assembled components facilitate field assembly and installation by your own or Link-Belt erectors.

MINIMUM OPERATING COST—These conveyors require a minimum of power for the tonnages of materials handled. Maintenance normally consists only of lubrication.

Check 3211 opposite last page



Workers willingly wear comfortable
knit-cotton lined **PIONEER**
Liquidproof Gloves All Day



Pioneer Knit-Cotton Lined Gloves with Non-Slip Grip

Style	Material	Weight	Color	Lining	Length
Stanzoil NL-34	Neoprene	Light	Blue/Black	Knit Cotton	10½"
Stanzoil NL-42	Neoprene	Heavy	Blue/Black	Knit Cotton	12"
Stanzoil NL-52	Neoprene	Heavy	Blue/Black	Knit Cotton	14"
Stanflex VL-34	Pylox	Medium	Red	Knit Cotton	10½"
Stanzoil NS-35	Neoprene	Light	Red	Cotton Flock*	10½"

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☐ 17" x 22" Full Line Glove Wall Chart
☐ Job Description Form For Free Hand Protection Analysis

Firm.....

Address.....

City.....Zone.....State.....

Requested by.....

Check 3212 opposite last page

NEW LITERATURE

Gage guards—to protect pressure-sensitive instruments and devices are described and illustrated in two-page bul. Complete specifications are given. Bul 546G — Industrial Engineering Corp., Louisville, Ky.

Check 3213 opposite last page.

Instrumentation handbook — of 52-pages explains uses of nuclear instrumentation in fields of medicine, industry, research and with reactors, is available on company letterhead request. Nuclear instrumentation handbook — Radiation Counter Labs. Inc., Skokie, Ill.

Strapping and material handling equipment is detailed in 52-page catalog which contains application photos, helpful charts, and other pertinent information. "Handbook of Strapping and Materials Handling Equipment" — A. J. Gerrard and Company, 1950 Hawthorne Ave., Melrose Park, Ill.

Check 3214 opposite last page.

Vibrating conveyor guide to proper selection of equipment for bulk materials gives information on material handling operations that can be performed simultaneously while conveying. Manual of 16-pages also contains flow charts, illustrations of various applications, capacities, dimensions, and other selection data. Cat 66 — Ajax Flexible Coupling Co. Inc., Westfield, N.Y.

Check 3215 opposite last page.

Simple calibration unit for use with radiation detection instruments is described in "How to Build It" instructions. Designed to meet AEC requirements, company's R-30 and R-31 sources utilizing cobalt-60 may be used in simplified calibration unit reviewed in instruction sheet. Calibration unit instructions — Technical Publications Dept., Tracerlab, Inc., 1601 Trapelo Rd., Waltham 54, Massachusetts.

Check 3216 opposite last page.

Silicone fluids used in mechanical applications are described in compilation of information contained in recently published eight-page guide. Among applications cited are advantages of using fluids in damping, springing, coupling and related mechanical applications. Brochure contains selection of tables, graphs and figures. Code 3-112 — Dow Corning Corporation, Midland, Mich.

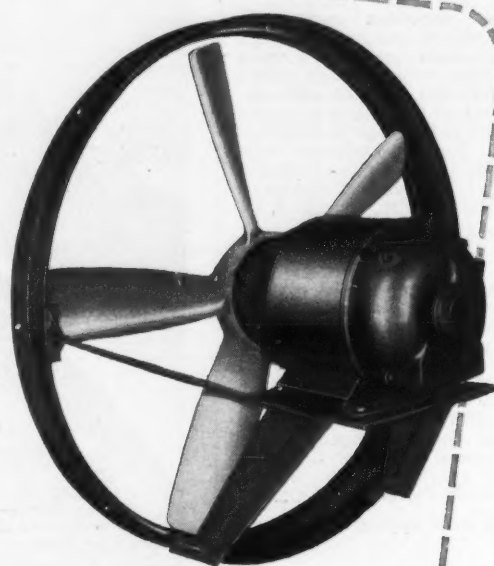
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MORE . . .

. . . New Literature on
facing page and page
166

PROPELLAIR

...built to solve
your "heavy duty"
ventilating problems



...mount in any position

Heavy duty Propellair Type "CD" fans are designed for versatility and rugged duty. They can be mounted in side walls, roof ventilators, hoods, ducts and machinery in any position you require. They are ideal for "tough" ventilating jobs like removing heat, moisture, smoke and dust laden air. You get greater efficiency and quieter operation, because the exclusive venturi entrance ring prevents wasteful recirculation. The rigid, cast aluminum, precision balanced air-foil propeller runs quieter and retains its clean aerodynamic characteristics at all operating pressures. Powered by dependable Robbins & Myers Motors of any design you need, they are covered by a single name-plate guarantee. Available in sizes from 12" to 60" for from 1020 to 85000 CFM air delivery. Let Propellair engineers survey your needs and recommend the correct ventilating equipment.

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MOVING AIR IS OUR BUSINESS

Check 3218 opposite last page

CHEMICAL PROCESSING

NEW LITERATURE

Electromagnetic vibrators for vibrating bins, hoppers, and chutes are subject of 12-page catalog containing descriptions, specifications, and other pertinent data for 14 standard models. Typical installations are illustrated in this vibrator cat — Syntron Company, 110 Lexington Ave., Homer City, Pa.

Check 3219
opp. last page.

Aluminum soap developed to gel solvents without use of heat is described in bulletin. Technical data and suggested uses are contained. Tech Service Bul — Witco Chemical Company, Inc., 122 E. 42nd St., New York 17, N. Y.

Check 3220
opp. last page.

Weighing and filling machine for packaging of free-flowing materials is described in bulletin that lists specs and details operation. Bul H-2 — Richardson Scale Co., Clifton, N. J.

Check 3221
opp. last page.

Glass tube variable-area flowmeter that gives positive indication of flow rate and provides positive means of synchronizing secondaries, is described in six-page Spec Bul 10A1700 O/U

— Fischer & Porter Co., 823 Jacksonville Rd., Hatboro, Pa.

Check 3222
opp. last page.

For more information on product at right, specify 3223 see information request blank opposite last page.



Photo Courtesy Kent Feeds, Inc.

Today's industries need Towmotor Continuous Operation

Stacks high...ducks low..."free lift" tops all!

Safely handling heavy loads, this compact Towmotor lift truck can enter carriers, boxcars and doorways a six-footer ducks under!

Yet Towmotor offers a free lift range that is greatest in the industry. And new Towmotor high lift masts are available that stack goods in tiers over twenty feet tall. Low-cost lifting, stacking and loading are chiefly what you buy lift trucks

for, and Towmotor does these jobs best!

Send for 24-page booklet, "What Makes Towmotor Tick?" detailing the superior features Towmotor Fork Lift Trucks offer today. Free Certified Job Studies relating to your business will also be sent on request.



Easy on Mechanics! Towmotor tilt-back seat and slip-socketed side panels permit 23-second access to engine and parts . . . without tools . . . a mechanic's dream!



Easy on Muscles! Towmotor Improved Power Steering triples driving ease; Towmotor TowmoTorque Drive adds cushioned "creep control" unequalled in the industry.



Easy on Operating Costs! New functional-design construction in Towmotor "Face-Maker" Series adds extra economy to Towmotor Continuous Operation. Model 540 shown.

Leaders for 39 years in building
Fork Lift Trucks, Tractors and Carriers

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Gerlinger Carrier Co. is a subsidiary of
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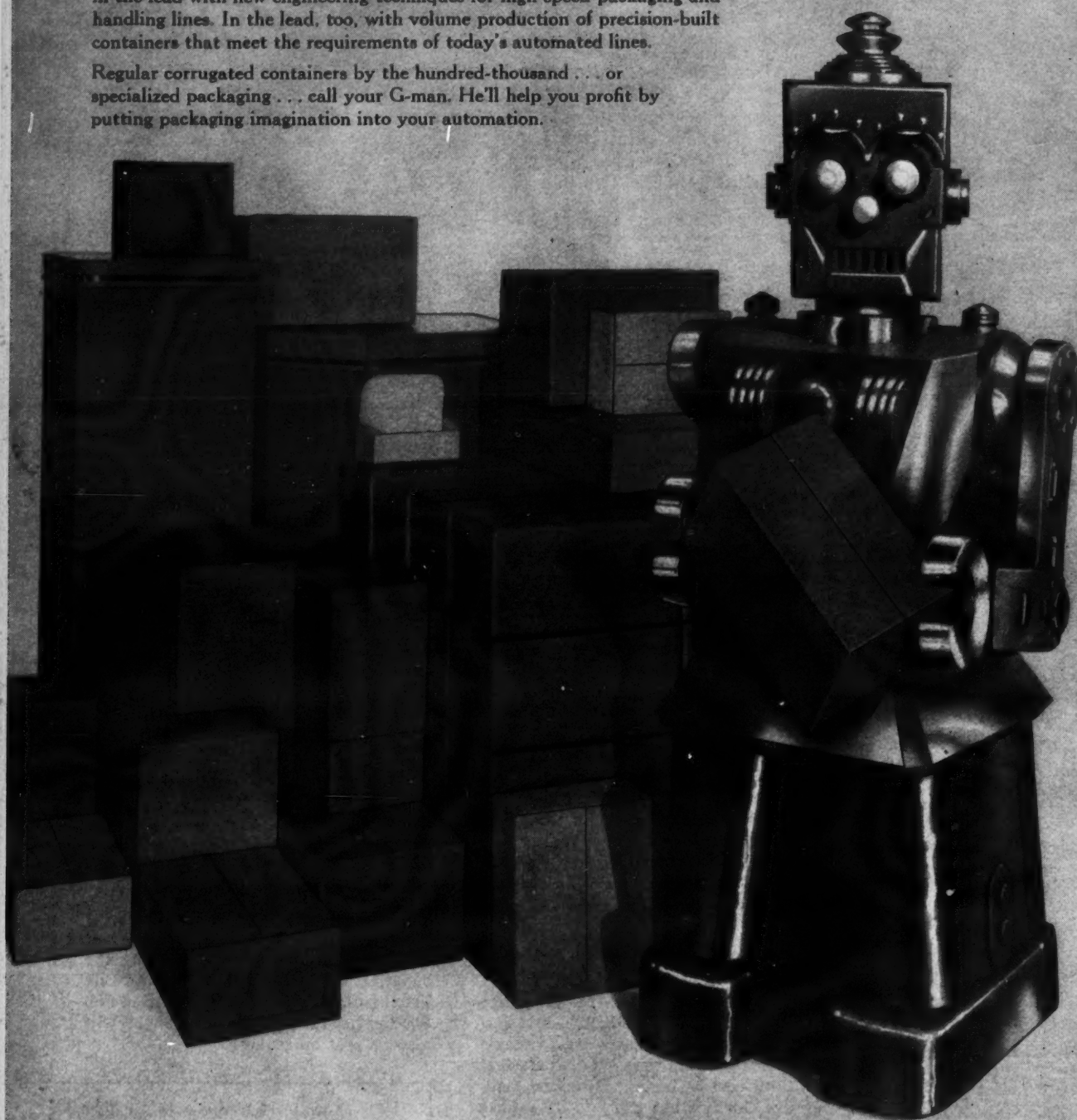
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Not ready for robots? Fast-moving progress in automation can out-date your packaging operations in just a few years. That's why you'll find Gaylord in the lead with new engineering techniques for high-speed packaging and handling lines. In the lead, too, with volume production of precision-built containers that meet the requirements of today's automated lines.

Regular corrugated containers by the hundred-thousand . . . or specialized packaging . . . call your G-man. He'll help you profit by putting packaging imagination into your automation.



GAYLORD
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HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

DIVISION OF **Crown Zellerbach Corporation**



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on product at
left, specify 3224
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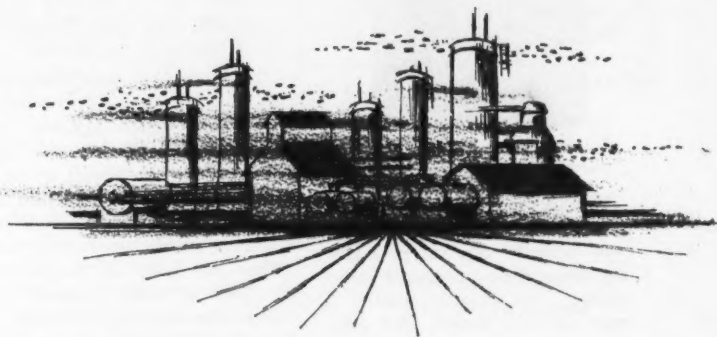


LEADERS VIEW '59...

EXCLUSIVE
REPORT

**Profit picture looks brighter if we
push hard for business**

At the invitation of the editors, ten Leaders report their opinions on "what's ahead in '59." Here's a cross-section of what to expect in the year ahead



Demand for goods to continue high

DR. W. G. MALCOLM, PRESIDENT, AMERICAN CYANAMID COMPANY — The long-term upward trend in business activity should continue for several years to come.



Dr. W. G. Malcolm

By the turn of the year, the Gross National Product should reach the peak dollar level achieved in 1957. However, because of continued inflation, the figure for GNP may tend

to exaggerate our actual recovery.

As I see it, inflation represents the greatest threat to real prosperity. Productivity undoubtedly will increase, and with the rise in population expected during the 1960's the demand for goods and services will continue to be high. We must try, however, to avoid endangering sound economic progress through continuously rising price levels. Wage increases far in excess of productivity gains render price increases inevitable.

As for the chemical industry specifically, since it supplies virtually all other industries, it must share the general recovery. Although there may have been over-expansion in some areas, I am confident that demand for the industry's products will gradually bring the industry's production to full capacity, and I look for the recovery of the industrial chemicals market to proceed apace with that of

general industry in 1959.

In addition to the continuing increase in population and with a consequent greater demand for food, two factors will affect the optimistic outlook in the agricultural chemicals field.

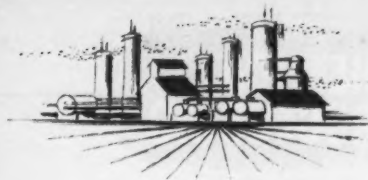
One is the increase in farm income, making it possible for farmers to devote a greater share of that income to farm improvement. The second is the ever-decreasing amount of land available for agricultural purposes. This means that returns per acre of both livestock and crops must be increased. Hence more efficient farm production will require greater use of fertilizers, insecticides, animal health products and feed additives.

Any consideration of the future of the chemical industry, or of any industry, must of necessity include an awareness of the increasing government involvement in business. We must be continually on guard to keep free our free

enterprise system, and to resist all unnecessary restrictions and encroachments upon the operations of American industry.

Increase in capacity of paper, board seen

DR. JOHN B. CALKIN, PRESIDENT, CALKIN & BAYLEY, INC. — For any but the most talented seers, a look ahead is necessarily preceded by a long, hard look into the past. From where we stand, the year 1956 was notable for an all-time peak production of paper and paperboard. Unprecedented expenditures for new plant and equipment in that year, followed in 1957 by further additions to existing capacity, plus decreased production, depressed the 1957 production ratio to 90 per-



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cent, its lowest since 1952. There was further expansion in 1958, but the industry is now operating at 92 percent because of increased product demand.



Dr. John B. Calkin

Management must at all times balance hazards of excess capacity against prospect of expanding demand and higher equipment costs a year or two hence. We may thus expect further additions to paper and board capacity in 1959 approximating the United States Department of Commerce estimate, which is 37 million tons, 16 percent over 1956.

The recent history of annual expansion at an average rate exceeding 5 percent leads us to consider that paper and board consumption will not overtake production capacity until 1960. Existing doubts relate mainly to the first half of 1959, and have been partially resolved as a result of recent paperboard gains, and by the current trend of the Gross National Product.

This index of economic activity, with which consumption of paper — especially package board and wrapping — is known to correlate well, rose sharply during the third quarter to \$440,000 million, 98.7 percent of the 1957 peak value. Many observers predict a 1958 peak surpassing that of last year.

One of the basic problems of the industry in recent years has been the unrelenting pressure of rising labor and other

costs on profit margins. During the first six months of 1958 effect of these factors coupled with increased unit cost due to less than full utilization of capacity has been to reduce profits to a level 20 percent under that of 1957. The following changes were observed during six months of 1957-58:

Production	off 2%
Sales	off 2.5%
Profit	off 20%
Prices	unchanged

It is evident that 1959 will see less emphasis on development of mill capacity and raw material sources, with more attention given to techniques of cost control and development of new markets and new products, including non-fiber products. In prospect as a part of 1959 research and development are studies of continuous pulping, coating and drying technology, utilization of fast-growing fibers, and economics of on-the-spot chipping.

New highs indicated in production, sales

RICHARD W. KIXMILLER, VICE PRESIDENT, CELANESE CORPORATION OF AMERICA AND GENERAL MANAGER, CELANESE CHEMICAL DIVISION — The demand of American industry for chemicals continues unabated. The petrochemical industry has shrugged off the recessions of last winter and spring and appears headed for new production and sales records during 1959.

Any forecast of improved business, however, should be based on restrained optimism. While substantial growth of the petrochemical industry seems sure for 1959, it is doubtful that the rate of growth will equal that of the

past few years. As petrochemicals become a bigger and bigger factor in the over-all chemical industry, their growth rate tends to more closely parallel that of the industry as a whole. An extension of long-term growth of petrochemicals at a rate somewhat below the 10 percent of recent years seems indicated.

Prominent among factors accounting for growth is replacement of natural materials by chemicals in many fields offering substantial potential volumes. Two examples may be noted in the steady replacement of oil-based paints by emulsion paints and superseding of conventional furniture cushioning materials by polyurethane foam.

Improved business is indicated also by the probability that soft and semi-durable goods will continue to attract a larger percentage of the consumer's dollar, as they did during 1958, with resulting demand for more plasticizers, finishes, fibers, plastics, coatings, and similar components and end products. Forecasts of sharp gains in consumption of synthetic and cellulosic fibers by the textile industry are particularly encouraging.



Richard W. KixMiller

For Celanese, the increasingly high compression ratios in newer cars indicate a climbing demand for gasoline additives, an area in which the company has seen substantial growth in the past few years and much interest for the future.

Since most chemical suppliers are currently operating at between 60 and 80 percent of capacity, additional requirements can be filled from existing capacity. The result of even a small increase in business would therefore be reflected in better profit figures. While additional capital construction will take place during 1959, it will be more for the demand expected in future years than for the one immediately ahead.

With polymer chemists learning more and more about the secrets of transforming basic chemicals into useful products of all descriptions, there is every indication that American industry will require increasing quantities of monomers for as far as we can see into the future.

Profits due to take definite upturn

W. WARD JACKSON, VICE PRESIDENT, COMMERCIAL SOLVENTS CORPORATION — Twenty percent of the U. S. Gross National Product (GNP) is currently accounted for by the chemicals industry. Fluctuations and trends in chemical sales are indicative of the general direction of the over-all economy.

Since chemicals are involved in production processes for just about every line of business, variations in chemical production and marketing patterns very frequently pre-empt similar variations in the rest of the economy six to 12 months later.

Business in the latter part of the third and in the fourth quarters of 1958 indicate a healthy year ahead. Recent volume increases in the chemical industry reflect stepped-up activity by companies in the hard goods and consumer

fields as they prepare for expanded post-recession markets.

Expect increased consumptions of such products as chemical additives, protective coatings, rubber and rubber chemicals, and synthetic fibers, with all of the chemicals used in their production.

We have reached the point in the chemical industry's demand-supply cycle where, in most lines, our capacity to produce has outdistanced the market's ability to consume. Recent estimates of cutbacks in investment for capital expansion during 1959 have been as high as 20 percent.

The production outlook is for more efficient use of existing facilities, with increasing emphasis upon development of a better ratio of dollar volume to invested capital. Improved production processes resulting in lower unit costs and higher yields will become increasingly important throughout 1959, which promises to be a highly competitive period.



W. Ward Jackson

Profits should take a definite upward turn in 1959. All factors considered, it does not appear that this upswing will be either rapid or as substantial as the increases in volume. Expanded profit margins will result largely from lowered costs, reflecting economies put into effect during the recent recession. In addition, decreased unit costs will have their effect on profits as more nearly optimum production levels are reached. The competitive outlook does not suggest any material or widespread increase in prices.

Employment in the chemical industry during 1959 is likely to reflect the technological ad-

vances of recent capital expansion and reductions in force executed during the recent recession. Cutbacks in new plants and facilities scheduled for the coming year, and the necessity for holding down costs in a competitive situation, are likely to work against increases in the chemical industry labor force.

Based on these considerations, such additional employment as may occur will probably be largely within the marketing and research areas. In the overall, it appears doubtful that there will be any appreciable increase in chemical industry employees. And there may be reductions in a few particularly oversupplied areas of the chemical industry as companies continue to pull in their belts for the sail through choppy, competitive waters.

The desire of companies to continue to enjoy and to expand the benefits of cost reduction programs which they put into effect during the past year is also likely to influence employment levels.

In summary, then, we can expect a generally healthy year in the chemical industry during 1959. Presently expanding markets will reach and surpass pre-recession levels in most cases. Profits will grow, too, but at a rate somewhat less than that of increased volume as competitive factors stemming largely from oversupply continue in many markets. A reasonable improvement in sales volume would be at least 10 percent over 1958.

Customer service, quality to improve

O. V. TRACY, DIRECTOR AND VICE PRESIDENT, ESSO STANDARD OIL COMPANY — Storm warnings are flying over the chemical processing field. Our barometer tells us they'll still be flying through 1959 as three dark clouds have built up into real thunderheads, exerting

considerable pressure on our businesses. These pressures may well continue through this year.



O. V. Tracy

Briefly, we have these:

... Over-capacity, both in petroleum and chemical industries.

... An increasing flow of chemical imports.

... Stiffer competition, both at home and abroad.

It is widely accepted that a continued period of over-capacity will result in a slowdown of new construction, and increased pressure on chemical prices. This trend was evident in 1958. And excess capacity could easily continue for a number of years.

Today, in this period of marked over-capacity, we often find customers in direct competition with former suppliers. And, by the same token, we often find suppliers competing with former customers in the end-products business.

At the same time, cut-rate competition from abroad is both a current and a long-range problem for domestic chemical marketers. This competition may come from either the Free World or, in some instances, from behind the Iron Curtain. A number of new chemical plants have been built in Western Europe — and more are planned. Each of these adds to the import flow into the U. S., and, at the same time, they cut sharply into our exports to Europe.

As more and more companies scramble for business, we find innovations all down the line. For instance, there is a decided trend toward integration. Companies not ordinarily in the chemical business

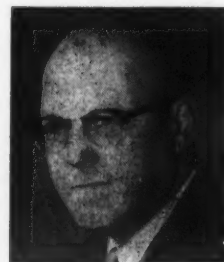
have combined with consuming companies in a search for a ready-made market. On the other hand, some consumers have built chemical plants of their own — plants that have added to the problem of over-capacity.

Competition, of course, is healthy and stimulating, except when it reaches a point where profit margins disappear. When this happens, each firm must read its own barometer — and find its own "umbrella."

It's easy to see there is no ready answer to the problems that now buffet the chemical processing field. But there is also little doubt the year will show a decided emphasis on quality and customer service — two of the best umbrellas we know.

Sales growth trend to be resumed

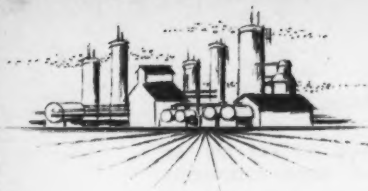
JOHN R. HOOVER, PRESIDENT, B. F. GOODRICH CHEMICAL COMPANY — The chemical industry is not the type likely to breed pessimism. Creative optimism has been both a cause and a result of the industry's dynamic growth and a prime motivator for continued expansion.



John R. Hoover

While 1959 will provide new challenges, it is our considered opinion the industry will experience a good year in which the familiar growth trend of sales will be resumed.

Two major factors in predicting 1959 volume are: 1)



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Continued recovery of the country's economy; 2) Increasing competition within the chemical industry.

The end of 1958 found a massive recovery from recession getting into full swing. Our confidence in our country's basic economic well-being is even further heightened by the following developments in specific industries which will benefit directly and indirectly the chemical industry:

Increased automobile production will certainly affect the chemical industry. Use of chemicals and chemical products in all parts of an automobile is growing tremendously. If auto production in 1959 is up 30 percent over 1958, as some sources estimate, this will have a great impact on sales of chemicals used in plastics, rubber, glass, metals, and paints.

Continued high-volume construction programs in residential housing, commercial buildings, highways, and other projects should be a great stimulating factor in 1959.

Rockets, missiles, and space exploration projects will consume increasingly high volume quantities of chemicals and chemical products.

Competition in the chemical industry grows keener each year. The number of producers of vinyl resin, for example, has more than doubled in the last six or seven years. In many product lines there is a resultant over-capacity, and it becomes a stern necessity to utilize more of the capacity profitably by building new markets. Thus, a strong and continuing research and development program assumes increasing importance.

There are continued inflationary trends in costs which, when coupled with price pressures — brought about by the highly competitive nature of the industry, compel the manufacturer to reduce as much as possible his costs of doing business. His success in doing

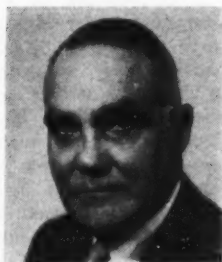
this may well be the deciding factor in staying competitive in a given field.

Market development 'blitz' needed

ALBERT E. FORSTER, PRESIDENT AND BOARD CHAIRMAN, HERCULES POWDER COMPANY — Although many factors will influence the chemical processing industry in 1959, two in particular, it seems to me, will have a determining influence on the health of the entire industry this year. These are: Excess capacity and market development.

At first glance these may seem to be entirely unrelated, but in my mind they are inseparable as a cause and effect. As we prepare to enter a year for which forecasts have been encouraging, we know there is one major and rather uniform "soft spot" in the chemical processing industry — potential over-production.

We have come through a year in which most, if not all of us have had to tighten our belts, trim off the fat, and



Albert E. Forster

sharpen our competitive skills. We are, in fact, charging into 1959 in the best of fighting trim. The most expert salesmanship, backed up with all the zeal and enthusiasm in the

world, however, will not move products of the chemical processing industry unless we go all out in the development of new markets and the consolidation and expansion of old ones.

It is in this role that I see market development as that second factor which could cancel out the soft spot of excess capacity. As new uses are found for old materials, and as new products are developed which take advantage of strong points of newer materials, we may see an end to the frequent periods of stagnation which occurred in 1958.

I believe 1959 will be a good year for the chemical processing industry if it remains alert to the dual challenge: To master the problem of over-production through creative and aggressive market development. I should add that no doubt the profit squeeze will be with us as a constant goad to more effective operation.

Prospects for sales appear excellent

G. R. BRYANT, PRESIDENT AND DIRECTOR, JEFFERSON CHEMICAL COMPANY, INC. — The petrochemical field has enjoyed more than a quarter century of sustained and constant growth. Although the long-range prospects for this field continue to be optimistic, 1958 witnessed a period of hesitation and appraisal. This period was undoubtedly the result of the recent business recession and the consequent decline in sales.

I believe, however, the situation will ultimately have its good effects since it has resulted in an appraisal of the present status of petrochemicals. This appraisal also included what future directions should be taken in order to

continue the history of rapid expansion.

It is common knowledge that at present productive capacity for almost all major petrochemicals exceeds current demand, and it will be



G. R. Bryant

several years before this surplus capacity is utilized.

There are numerous factors which have led to over-expansion in the petrochemical field. During the last 10 years it was virtually impossible to find a petroleum-derived chemical whose consumption was not soaring. Past experience has shown that during such periods, productive capacity is placed onstream with more than enough rapidity to keep pace with the market.

A second factor which has led to the present situation is the interest developed by oil companies in the petrochemical field. Some oil companies have made available increased quantities of ethylene and propylene and encouraged chemical companies to utilize these raw materials.

Lastly, the high level of exports for several large petrochemicals has probably encouraged companies into entering the market.

A current appraisal of the petrochemical field leads to the conclusion that marketing of petroleum-based products has achieved an extremely competitive status, which can largely be attributed to two influencing factors.

Within recent years, petrochemical technology has become more widely known and, therefore, it has become increasingly easy for companies to enter the field. The present state of over-capacity also was certainly a contributing factor to this competitive atmosphere. It appears likely that the petrochemical business will remain competitive for some time due to persistent domestic over-capacity. This could be further intensified by a decline in U. S. exports as a result of the rapid growth of the foreign petrochemical field and the development of the European Common Market.

Increased competition means that successful petrochemical companies will have to operate with more efficient and modern production facilities, lower costs, and aggressively paced marketing techniques. In the case of Jefferson Chemical Company, we are in the last stages of putting a major plant expansion onstream.

Decision to undertake this expansion program was heavily influenced by realizing that greater efficiency of operation, beginning with manufacturing facilities and carrying through to distribution, technical service, marketing and new product development, was essential in this increasingly competitive situation.

Despite the somewhat sobering conclusions expressed above, I am sure the pendulum will ultimately swing back to the growth pattern to which the petrochemical field has been accustomed. Beyond doubt, current over-expansion will be utilized, and in the future even greater plant capacity will be required.

In addition to the continuing growth pattern of basic petrochemicals, the field also has many opportunities to supplement this growth. The constantly developing petrochemical technology will in the future yield new and unique products which will find their own markets or result in the production of presently commercial chemicals by new processes.

A prime example which can

be cited is the recent announcement by a major petrochemical producer of a process for the production of longer chain alcohols which, up until now, were available only from natural sources. Propylene chemistry, which has traditionally taken a back seat to its brother olefin — ethylene, has recently shown great promise as a petrochemical raw material. Polypropylene, although only in its infancy, has already been picked by market observers as a product with a tremendous potential.

Prospects for 1959 sales appear excellent. Although excess capacity will exist, the over-all pattern of petrochemicals should be good. Looking back, let us call 1958 a period of consolidation, analysis and planning — a time when the rapidly expanding petrochemical companies took time to consider not only where they are but where they should be going.

Consumer goods outlook bright

STANLEY DE J. OSBORNE, PRESIDENT, OLIN MATHIESON CHEMICAL CORPORATION — The rate of business activity in the chemical processing industry



Stanley de J. Osborne

is inevitably related to general industrial production. Since the economy has been pulling out of the recession ever since the second quarter of 1958, we look forward to improved earnings in the year ahead.

The expected general increase in business activity can

provide greater relative benefits to the chemical and related industries than to many others. Most chemical plants can operate profitably only at near or full capacity. Unlike other industries, they cannot significantly reduce operating costs simply by cutting production or reducing employment.

Even though the recession of the past year had an adverse effect on employment, it did not continue long enough to have a similar effect on savings, or the sum total of disposable income. Buying decisions for consumer goods were merely postponed and are now apt to be filled. The resulting demand, by keeping chemical plants closer to desired near-capacity operations, should offer a profit potential greater than the increment enjoyed by manufacturing generally.

Paradoxically, the recession itself has brought another advantage to companies in the chemical processing field. After a long period of seemingly unlimited growth and expansion, the recession enforced a cold, hard, and realistic examination of direction and internal operation.

Those companies which met the challenge of the recession by reducing operating costs, analyzing product lines for current and potential profitability, re-examining merchandising and marketing techniques, and meeting their basic problems of production and administration, have emerged in a stronger competitive position than ever.

At Olin Mathieson we have just completed an organization program to provide greater operational efficiency within our various divisions. One result is that industrial, organic, agricultural, and phosphate chemical operations have been consolidated into a single Chemicals Division. This is symptomatic of the recent trend to improve administrative efficiency, integrate related operations and, in general, streamline corporate structures.

In my opinion, those companies in the chemical proc-

essing industries that have banked the most on the lessons of the past year will draw the greatest interest from them in 1959.

Technical ambitions should be tailored to firm's assets

WILLIAM P. DRAKE, PRESIDENT, PENNSALT CHEMICALS CORPORATION — Future performance of any chemical company may well depend on the success of its research efforts. Economic conditions prevailing through most of 1958 forced managements to review critically all phases of their companies' operations as they budgeted their 1959 expenses.



William P. Drake

One activity commanding particular attention is the company's research program. "How can we make all those dollars we are spending on research pay dividends to our shareholders?" is a question which I am sure has been asked many times by management people.

Profitable research always is one of the most challenging enigmas to corporate management. Proper yardsticks are so elusive that many of us cannot even recognize good results when we have them. I shall therefore try to describe our company's approach to profitable research for whatever value it may have. When evaluating this approach one should bear in mind that it relates to a medium-size

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BULGING EUROMARKET

Beckoning to CP Industry

... but Successful Ventures Hinge on Fast Action

Dr. A. T. Knoppers, President
Merck Sharp & Dohme International

Highlights of Euromarket Impact on CP Industry

What will be the impact on the American chemical processing industry when the six countries of the Euromarket perfect their organization?

Dr. Knoppers:

Emphasizes exports of chemicals to Euromarket will diminish gradually

Underscores further pooling of chemical company resources

Reveals belief trade surplus favoring Euromarket might develop

Outlines possibility of one Euro-American chemical family

THE SIX COUNTRIES of the Euromarket on January 1 reduced internal tariffs by 10% — first of a series of planned reductions which will gradually remove existing tariffs between France, West Germany, Italy, and the three Benelux countries.

It took U. S. industry some time to realize that terms of the new European Economic Community had to be given major consideration. Data on direct 1957 U. S. investments in the six member countries do not show an augmented flow in anticipation of Euromarket arrangements. However, there are many indications that this flow will be substantial in 1959.

These nations have taken a bold step to become gradually one big market with federally instituted economic and political councils. Specifically, it is interesting to note the European Common Market concept seems to have been strengthened in the recently formed Fifth Republic of France.

These developments have changed the investment timetable of many U. S. industries. Advanced projects for investments at home or abroad were retarded in 1957 and 1958, and fresh, close consideration is being given to challenging opportunities of a progressive and industrious market with 170 million people who have many desires and requirements still to be filled.

Industrial production and total consumption in Europe have been rising during the

last few years at a faster rate than in our country. The European chemical industry in particular has expanded rapidly. Total 1957 production of chemicals in Organization for European Economic Co-operation countries was 10% higher than in 1956. Total production of Euromarket countries in 1957 was close to 10 billion dollars, of which the pharmaceutical industry alone accounted for one billion dollars, or 10%.

Although it is difficult and dangerous to compare in dollars the output of Euromarket's chemical industry with that of the U. S. — which is estimated at 23 billion dollars — these figures indicate U. S. output is almost twice as large as that in Euromarket countries. "Almost," we say, because a price adjustment of 15% is for this comparison certainly justified.

Only one percent of total U. S. chemical production was exported to the six Euromarket countries in 1957. It is believed, however, that our exports of chemicals to these countries will diminish gradually. Intra-Euromarket trade in chemical products will intensify, and most probably Euromarket exports to U. S. will increase. At present, Euromarket exports to this country are running behind our exports to Euromarket. But, in the coming years, imports and exports between the world's two most important centers of chemical industries

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A doctor of medicine and also a doctor of pharmacology, Dr. Antoine T. Knoppers has been president of Merck Sharp & Dohme International since October 1957. Previously he had been vice president and general manager, director scientific activities, and director medical services.

A native of The Netherlands, Dr. Knoppers was graduated from the University of Amsterdam, where he received both doctorates.

Among many important posts and memberships Dr. Knoppers has held are honorary fellow, Royal Institute of Tropical Hygiene, Amsterdam; member, Malaria Commission of The Netherlands; member, Malaria Commission of North Holland. He is currently a member of the American Society of Tropical Medicine, Association of Medical Directors, and member of board, World Medical Association, United States Committee.



GROUP INVENTION — antidote to organizational inertia

How should a company go about acquiring the new product ideas that it needs. This is today's fashionable question. Even a simple answer requires a candid discussion of the organizational 'obstacle course' for new ideas . . .

DR. DONALD A. SCHON, Arthur D. Little, Inc., Cambridge, Mass.

WHILE it is usually assumed that company management (as apart from the company executives) is eager for new products, actually — and with good reason — management's attitude toward new product ideas tends to be ambiguous. In fact, a good case can be made that management may regard these ideas as a nuisance. And the newer the idea, the more of a nuisance.

Organizations Resist Change!

New product ideas include everything from new tail fins on an automobile to engines based on a new principle of power. The higher on the novelty scale (the closer to use of new principles of one kind or another), the more change is required to implement the idea. And organizations resist change!

The effort required to overcome this organizational inertia can be monumental. A rough calculation of the time and money expended on a new hub-cap by an automobile company is indicative. Structure and material of the hub-cap are basically old; only appearance is new. But the result is staggering if all effort is taken into account that's expended in engineering, industrial design, production, inventory control, sales, and advertising.

And here the product is only marginally new. It is even more intimidating to consider the organizational "obstacle course" encountered in a large corporation when the product is radically new.

It's no wonder, then, that many an executive dreams of making something like Coca Cola, with a product line consisting over the years of nothing but bottle upon identical bottle of the same carbonated liquid.

Can the Independent Inventor Be Used?

With the need of companies to generate continually their own new product ideas, sparks have been added to the controversy between proponents of "individual" as opposed to "group" invention. The seriousness of this lack of independent inventors is generally admitted, and it is often suggested that these odd-ball amateurs, sometimes from cellar work-shops, be recruited.

Perhaps the most important argument against the independent inventor is that he is frequently unpredictable and undependable. A company at any given time does not need any new product; it needs a new product that *meets a specific set of conditions*. Perhaps it wants to balance its product line by developing consumer

as well as industrial products. Perhaps it wants to meet a particular threat created by a competitor. The likelihood of such ideas being generated by independent, individual inventors is small.

Invention Groups

Invention groups at Arthur D. Little, Inc., Kimberly-Clark, Dewey and Almy, and others, have shown over the past seven years that there are ways of selecting people, working conditions, and techniques to increase the probability of needed inventions. Of course, these groups have not shown there is a mechanical "method" or "recipe" for invention.

Without even considering the inventiveness of the indi-

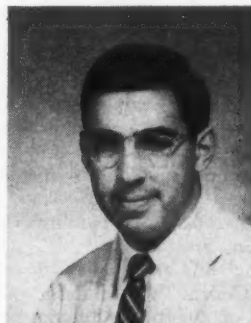
vidual as opposed to the group, these invention groups have shown they can make a significant contribution besides creating new products. A group can sell the product idea. It can act as an antidote to overcome the organization's inertia.

An Individual Is Handicapped

Powerful forces operate within an organization to keep things running in the smooth and familiar paths. These frequently are brought to bear on the individual whose new product ideas are a potentially-disrupting influence.

The constant demands of routine, the need to put out fires, the negativity of professional "experts", the indif-

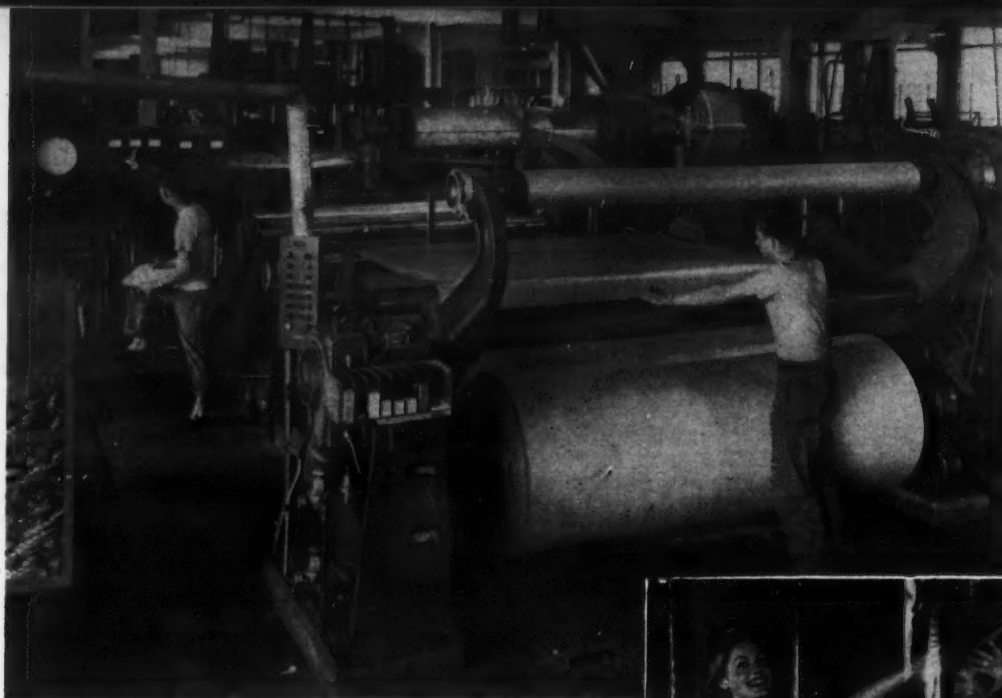
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Donald A. Schon is in charge of a product invention group at Arthur D. Little, Inc., engineering and industrial research consulting company in Cambridge, Mass.

Dr. Schon has been interested in problem solving and the process of invention since his graduate work at Harvard University. Not only has he instructed many groups in problem solving techniques, but the recent interest in this problem-area has led him to make many talks on the techniques of group creativity. He has also given courses in philosophy at UCLA and Kansas City University.

Here's a polyethylene coating extruder installation. Technique is called "casting". Pellets of polyethylene are loaded into hopper (upper center)
(Photo—St. Regis Paper Co.)



Growth sector in chemical industry is being carved out in marriage of plastics and paper. And now, with development of polyethylene-coated corrugated board . . .

markets for POLYETHYLENE expand again

A CP Staff Report

The rapid pace of expansion of the polyethylene industry has led to many questions as to whether the polyethylene producers will run out of market before they run out of plant capacity. Producers have maintained that many promising markets are still relatively untapped. Latest indications are that they are entirely right in their estimates. Take polyethylene coating of corrugated board as an example.

"The recent development of polyethylene-coated corrugated board is one of major potential, and might conceivably play an important role in the future growth of the polyethylene industry." So says Vincent McCarthy, manager of polyethylene sales of U.S.I. Chemicals Company.

In 1957, over 200 billion square feet, almost seven million tons, of corrugated board were produced. And, says Mc-

Carthy, "If polyethylene can find application in even one percent of this total, it would amount to nearly 70,000 tons of polyethylene-coated corrugated board. This is almost twice as much as the combined tonnages of paper and paper-board which were actually extrusion-coated in 1957, using up in the process about 20 million pounds of polyethylene."

And if a more logical figure turns out to be ten percent rather than one percent of the total corrugated board produced, the consumption of polyethylene in this latest marriage of plastic and paper might easily turn out to be 400 million pounds, in addition to present requirements of 30 million pounds for coating paper, film, and foil.

Speaking of the over-all outlook, George V. Johnson, secretary of the polyethylene

extrusion coaters group of Specialty Paper and Board Affiliates, Inc., of New York City, a trade association, is even more enthusiastic. "The polyethylene extrusion-coated paper and board industry will be one of the tremendous growth industries of the 1960's. Its status will have a profound effect on the chemical and petrochemical industries that will be supplying the materials for this huge expansion."

None of this is news to the producers of polyethylene who have been carefully nurturing the progress of this so potentially profitable market.

But there is a villain in the picture. Several breakthroughs are needed in the know-how of coating the polyethylene on the board.

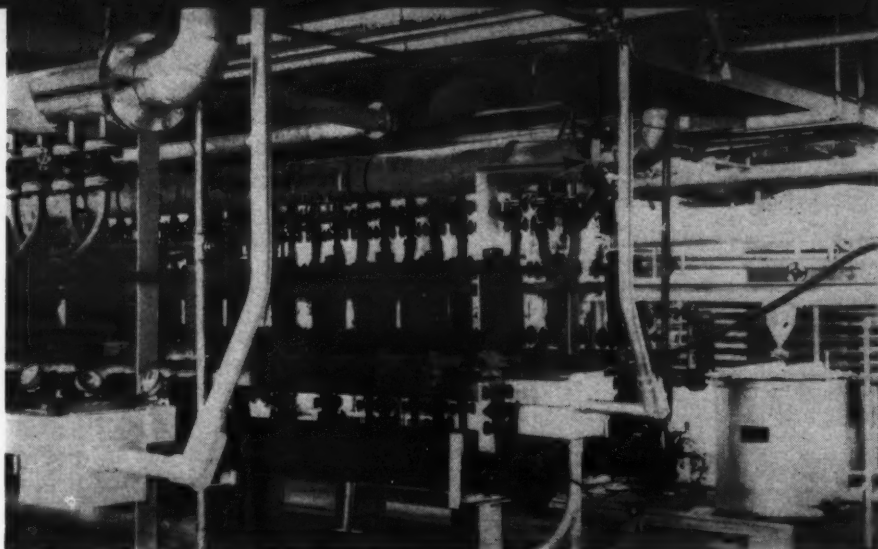
The simplest way of applying the polyethylene is to coat the board during its manufacture. If corrugated board is involved, this means before corrugation. But the corrugation process requires heat, more than present-day polyethylene can withstand.

An alternate method is to apply the polyethylene after the board has been manufactured, using adhesives for glu-

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Clarity of film produced on paper by coating equipment with "casting" technique is exemplified by twin at left. Film produced by more conventional method is at right.
(Photo—U.S.I. Chemicals Co.)



NEW SOLUTIONS
of processing problems

◀ In formaldehyde plant, safe operation of high-temperature contact battery is assured through use of 6" impervious graphite rupture discs at strategic points, as that shown by arrow

Impervious Graphite Rupture Discs Resist Temperature of 250°F

No replacements needed in three years on this formaldehyde application — also have given good service on vinyl acetate reactor where they withstand pressures varying from 26" Hg vacuum to 25 psi

GORDON WEYERMULLER
Associate Editor

IMPERVIOUS graphite rupture discs have lasted three years so far at The Borden Company in applications where previous discs failed in as short a time as three months. This has saved manpower and materials as well as insuring safe operation of equipment.

Rupture discs are used in two applications at Borden — in a formaldehyde plant, and in a vinyl acetate polymerization plant. In the former, temperatures up to 250°F must be withstood, while in the latter, pressures vary from 26" Hg vacuum to 25 psi.

Formaldehyde Plant

In the formaldehyde plant, four 6" discs, rated at 20 psi rupture, are installed at strategic points on the primary process gas supply header. This header feeds directly to the high temperature contact battery in which the synthesis of formaldehyde takes place. Process gas, consisting of methanol and air, is controlled in the non-explosive mixture range — rich in methanol. However, due to possible equipment failure, this mixture could quickly change to the explosive range — lean in methanol. With a high temperature, 750°F, already existent in the contact battery, an explosion could be triggered instantly. With a view to both personnel safety and equipment security, rupture

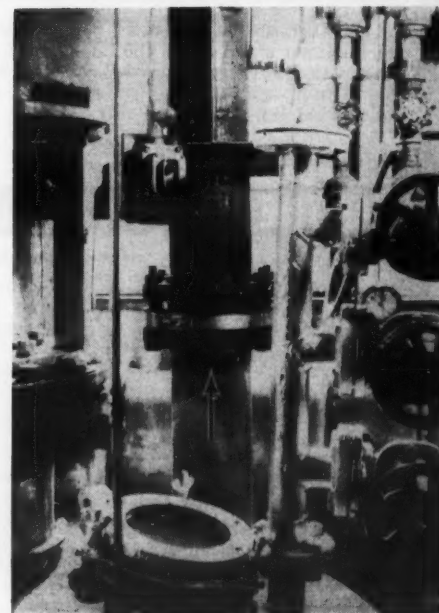
discs were installed as a safeguard.

Rupture discs are mounted at pipe header, tee joints, and ends — using a VanStone backup flange connection. Lightweight sheet metal exhausts are fitted to the outside so that exhaust gases would be vented upward should an explosion occur.

Service is continuous with operating pressure maintained at 4-5 psi. There is no fluctuation in pressure. Plant runs continuously with two-day shutdowns at one-to-two-month intervals. Process gas is slightly corrosive to ferrous metals and aluminum — but exhibits no corrosive tendencies on the impervious graphite discs.

Although previous discs used in this service required replacement every year due

In vinyl acetate polymerization plant, 6" impervious graphite rupture disc (arrow) functioned adequately relieving dangerous pressure buildup. It ruptured clean, giving a full 6" relief opening



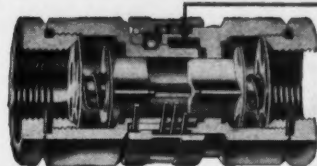
WHICH SNAP-TITE QUICK CONNECT COUPLING IS BEST FOR YOU?



SNAP-TITE "H" COUPLING FOR HIGH PRESSURE APPLICATIONS

FOR HYDRAULIC OR AIR

"H" Coupling for high strength, higher efficiency, high-resistance to heavy line surge. Sizes: $\frac{1}{8}$ " thru 12". Bulletin No. 240

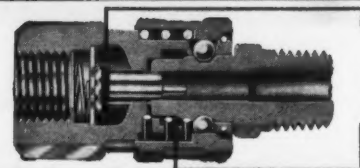


Exclusive U-packer gives a positive seal without compression set because of rubber distortion. Line pressure inside the U-packer keeps it open and forced against its metal backing—the higher the pressure, the tighter the seal.

SNAP-TITE HI-FLOW COUPLING FOR LOW PRESSURE APPLICATIONS

FOR AIR AND FLUIDS UP TO 150 p.s.i.

Hi-Flow is recommended to connect small air tools to plant air system, and for low pressure fluid transfer in small lines. Sizes: $\frac{1}{8}$ " thru $\frac{1}{2}$ ". Bulletin No. 230

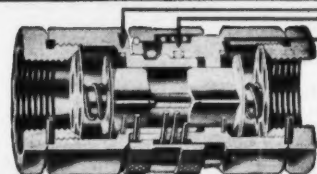


Bonded valve washer (pat. pending on valve construction)
Exclusive U-packer

SNAP-TITE 'T' COUPLING FOR HARD TO HANDLE FLUIDS

FOR FUMING ACIDS, ALKALIES, SOLVENTS . . .

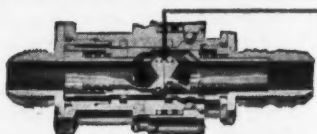
"T" is the only coupling now on the market for fluid temperatures from -40°F to +400°F. Its seals are made of Teflon for which there is no known solvent. Sizes: $\frac{1}{8}$ " thru 3". Bulletin No. 270.



Teflon Valve Seal
Teflon Nipple Seal
Teflon Valve Seal

SNAP-TITE NO-SPILL COUPLING FOR MINIMUM AIR INCLUSION

FOR AIRCRAFT, MISSILE HYDRAULIC, FUEL SYSTEMS which cannot stand air in the lines, and for transmitting fluids which *must not spill*, the Snap-Tite no-spill coupling is recommended. Bulletin No. 260A

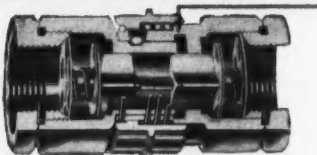


Flush valves prevent spillage, air inclusion. Snap-Tite will engineer special variations to your requirements.

SNAP-TITE "E" COUPLING FOR VACUUM and VERY LOW PRESSURE

FOR VACUUM SYSTEMS IN THE MICRON RANGE

"E" Coupling performs in the micron range in the smaller sizes both connected and disconnected. Recommended, too, for gravity flow . . . U.L. approved for LP Gas. Sizes: $\frac{1}{8}$ " thru 10". Bulletin No. 250



Nipple seals in coupler by depressing the lip of the E packer and slightly compressing the body of the packer. This new E-packer gives positive seal under high-pressure, low-pressure, and vacuum.

Snap-Tite Couplings are available plain, (without valve), and with either single or double shut-off. Couplings normally furnished in alloy steel, but all (except hi-flow) are also available in brass, aluminum, or stainless steel with a variety of finishes.

SNAP-TITE, INC., UNION CITY 6, PA.

Snap-Tite

**SNAP-TITE COUPLINGS
CAN HANDLE ALMOST
ANYTHING THAT FLOWS**

NEW SOLUTIONS

to fatigue, impervious graphite discs have lasted three years so far. There has been no indication of possible failure due to stress or fatigue. A life of five years is expected for present discs in this formaldehyde service.

At vinyl acetate polymerization plant, a single impervious graphite rupture disc is fitted into a 6" relief pipe on a 1000-gal reactor. An adjustable support rod is used to prevent damage from torque and deadweight. This disc is for relief of pressure from either a possible explosion or excessive pressure buildup from exothermic reactions involved. Vinyl acetate monomer vapor is normally present at 100% concentration. However, during beginning and ending phases of batch process, acetate vapor has varying percentages of air admixed such that an explosive mixture can be present. Oxidizing and reducing agents are present in addition to vapors of vinyl acetate and allied chemicals.

About 90% of the time the reactor operates at atmospheric pressure. During initial and final stages of cycle, reactor is alternately subjected to 26" Hg vacuum and to 25 psi air pressure. Service is intermittent. Usually one or two cycles are performed each day on a five-day-week basis.

While previous discs in this service had to be replaced every three months, due to failure from fatigue, impervious graphite discs have lasted three years so far. Since none have failed due to fatigue or corrosive attack, they have exhibited an unlimited life.

In one instance, the impervious graphite disc performed its function adequately by relieving the reactor pressure during a dangerous pressure buildup occurrence. Unit ruptured clean, giving a full 6" relief opening.

Discs are furnished in diameters to 30" for burst ratings to 300 psi, at temperatures to 1300°F.

(Impervite rupture discs are product of Falls Industries, Inc., Aurora Rd., Solon, Ohio.)

Check 3226 opposite last page.

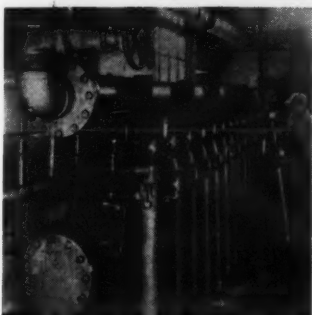
Check 3225 opposite last page

NEW SOLUTIONS

Water problem whipped by effective filters at bleachery

Problem: Large quantities of clean water were required by an Aurora, Illinois, bleachery. Located on banks of the Fox River, there was an ample water supply, but quality was not always good.

Plant processes over 100,000 yards of cotton goods per day. Water requirements for bleaching, washing, and dyeing processes average about 20 gpm per yard of production.



Individual filter units can be removed from line, inspected, and put back into operation in matter of minutes

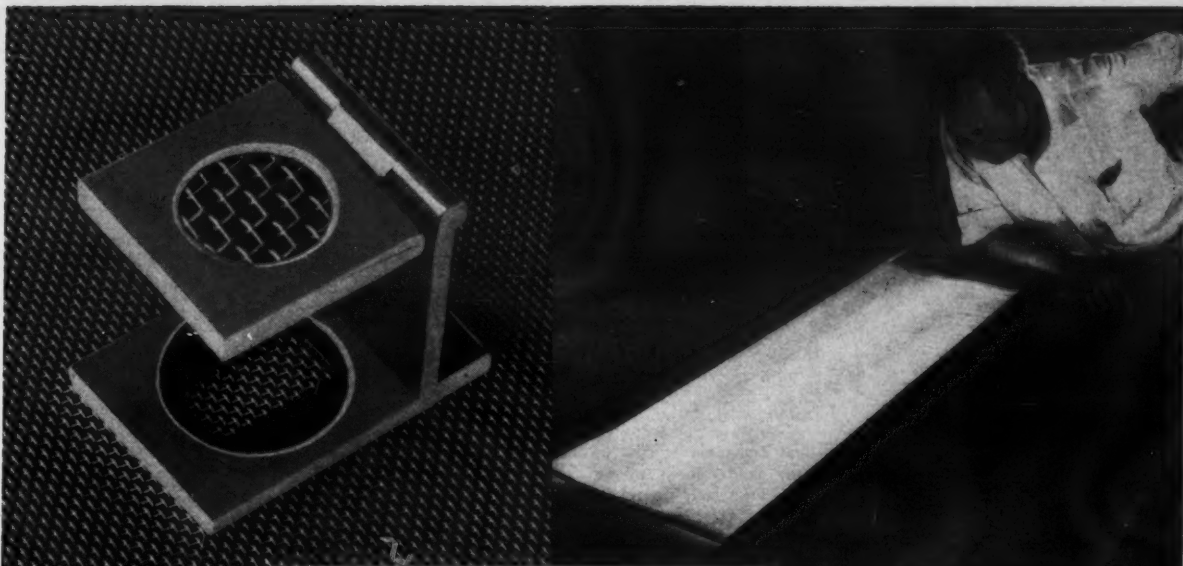
Solution: Series of quick-coupling filter units, mounted in parallel, were installed to clarify the river water. Each filter measures $3\frac{1}{4} \times 36"$. Units are available to handle from 50 to 1600 gpm at pressures up to 200 psi and temperatures up to 200°F. Particle size retention ranges from 30 to 700 mesh, or 0.023 to 0.0012".

Results: Filters satisfactorily provide about two million gallons of clean water per day. Individual units may be removed from line, inspected, and put back into operation in matter of minutes. Quick-acting valves permit this to be done without tools.

When differential pressure, as indicated by individual inlet and outlet gages on each filter, exceeds 10 or 15 psi, unit is backwashed, blown down, and quickly cleaned.

(Model 216 Multiplex filter units are product of Ronningen-Petter Co., 2700 S. 27th St., Vicksburg, Mich.)

Check 3227 opposite last page.



Who counts 'em?

CAMBRIDGE does . . .

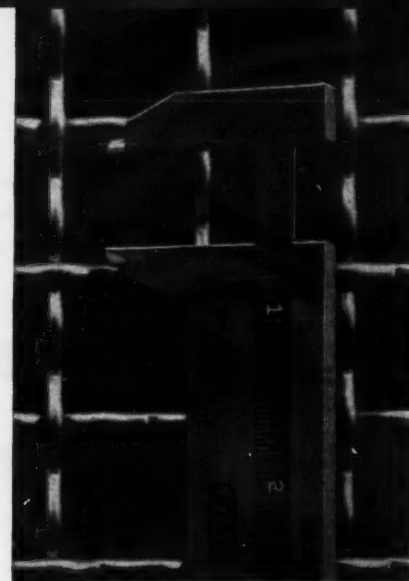
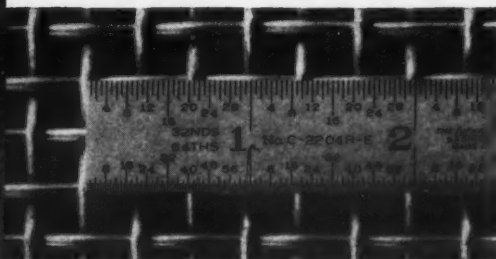
. . . because *exact* mesh count and mesh size are the trademarks of Cambridge INDUSTRIAL WIRE CLOTH.

But, quality isn't the whole story. When you call Cambridge for industrial wire cloth, you also get service . . . prompt answers to your inquiries . . . quicker deliveries . . . and an experienced Field Representative who follows up your order to make sure our product is giving you the best possible service. Let us quote on your wire cloth needs. We manufacture wire cloth from any metal or alloy—including titanium—in nine basic weaves. Very likely, we have what you require in our warehouse right now. For samples or more information, call your Cambridge Field Engineer...he's listed in the yellow pages under "Wire Cloth". Or, write for FREE 94-PAGE CATALOG.

The Cambridge Wire Cloth Co.

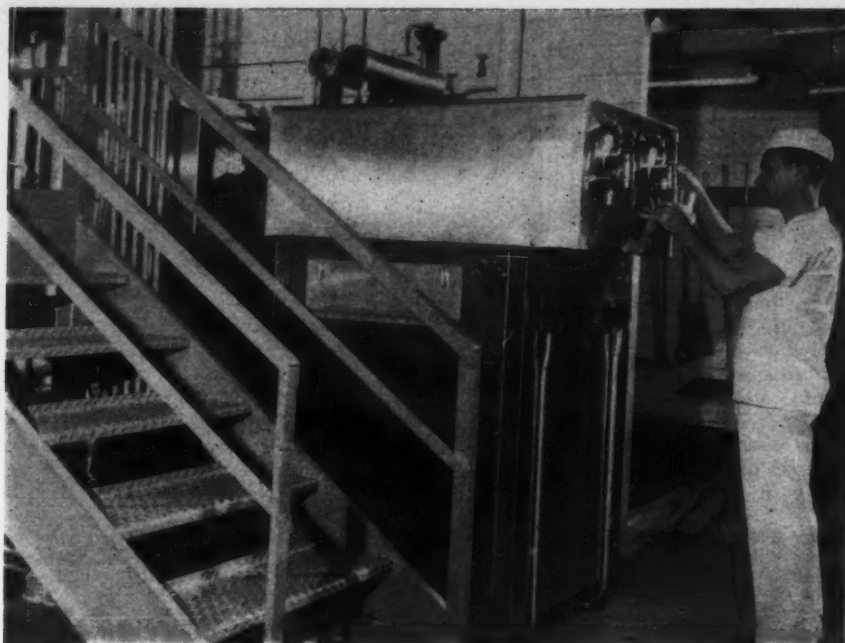
Department F • Cambridge 1, Md.

Manufacturers of Wire Cloth,
Metal-Mesh Conveyor Belts, Wire Cloth Fabrications



Check 3228 opposite last page

Packaged heat exchanger at Eli Lilly and Company lends neat appearance to plant, turns out top-quality starch paste for tablet production. Operator is shown sampling unit



Photos by CP Staff

Substituting compact, efficient, heat transfer unit for difficult-to-control tub and steam-hose method, Eli Lilly and Company streamlines a tedious, time-consuming operation. Turning out a uniformly-consistent, top-quality product, packaged machine . . .

CUTS STARCH HYDROLYZING TIME FROM HOURS TO MINUTES

TED F. MEINHOLD, Associate Editor

Problem: Preparation of a partially hydrolyzed starch paste, used as a binder in various pharmaceutical tablet formulations, presented a time-consuming and difficult-to-control operation at Eli Lilly and Company of Indianapolis, Indiana.

The method used for making starch paste consisted of heating a mixture of starch and water in 10-gallon stainless steel containers. This was accomplished by inserting a steam hose in the mixture and applying heat in the form of live steam until the temperature reached approximately 70°C. During this operation, it was necessary to keep the steam hose in constant motion

to prevent overcooking or burning the paste.

Once the paste reached a certain degree of "tackiness" (as determined by the operator's sense of touch), the heat was removed and the paste allowed to cool.

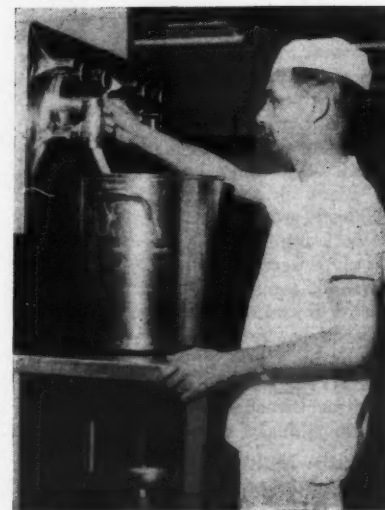
The cooling operation was particularly time-consuming. Carried out in water-filled sinks, with only occasional agitation, it required two to three hours.

The lack of uniformity between batches presented a serious problem and frequently resulted in batches being discarded and presented further delays in processing.

Solution: The development engineers at Lilly, in conjunc-

tion with those at General Equipment Mfg. Co., designed and installed a compact, packaged heat exchanger to perform the starch hydrolyzing job. The unit was specifically designed for this application but was constructed of basic components, standard with General Equipment whose units of this type are processing various viscous, hard-to-handle products in the chemical and food industries.

The heat exchanger at Lilly measures 36" wide by 54" high by 57" long, having two 7" ID by 48" long jacketed, Type-304 stainless product tubes. Valving is arranged to provide circulation of 120°, 180°, and 35°F water for fixed interval through the jacketed



Partially-hydrolyzed starch is drawn off into tubs every 15 minutes

tubes. The chilled water (35°F) is obtained from a self-contained F-12 refrigeration system built under the tubes. The hot water is obtained from heating tanks installed outside the machine. A self-contained pump for each tube circulates the heating and cooling water and the valves control which source is in use. The only interchange of water sources is the volume in the jacket of the heat exchanger tube at source changeovers.

Each product tube is fitted with a 3-hp reduction drive which rotates an agitator carrying scraper blades. The moving scraper blades inside the tubes constantly remove film next to the wall to assure maximum heat transfer efficiency. The blade supports have an auger effect and provide the forward thrust on the product to empty the tubes, making a product pump unnecessary. Front and rear ends of product tubes are easily removed for cleaning.

The heat transfer equipment is used in conjunction with a 300- and 30-gal capacity tank. First step in the operation is preparation of a 25 percent starch solution in the 300-gal tank. Deionized water is used to make the slurry.

Small portion from large tank is pumped to 30-gal tank, which serves as feed tank for heat exchanger. Additives, such as gelatin and other binders, are added to the slurry while in the small tank.

The two tubes in the heat exchanger are filled and emptied alternately — resulting in semi-continuous operation. Each tube holds about 6 gal, giving unit total capacity of 12 gal.

Starch preparation is fed to unit by gravity. Entering tube, it is agitated and gradually heated by means of hot water circulating in tube's jacket. After about 7 minutes, hot water is replaced by 35°F water. Product is cooled in the jacket for about 5 or 6 minutes and drawn off into tubs for further use in tablet production.

Results: Heat exchanger turns out 2 uniformly con-

To bottom of page 39

Mold a Heat-Saving Overcoat on Hard-to-Fit Shapes with



...BALDWIN-HILL

No. 1 INSULATING CEMENT

On such complicated shapes as this steam turbine shell and its exhaust piping at Philadelphia Electric Company's Schuylkill Station, B-H No. 1 Insulating Cement was applied easily and quickly to the irregular surfaces.

Because No. 1 Cement is effective to 1800° F, applicators were able to apply the proper thicknesses of insulation to compensate for the varying surface temperatures of the different zones of the turbine. For instance, on the high pressure shell, 10" of cement was applied on the hottest (1050° F) and 7½" on the coolest (800° F) sections.

An added advantage, for maintenance purposes, is that No. 1 may be removed from equipment where temperatures have not exceeded 1200° F and reapplied elsewhere. And a rust inhibitor prevents any corrosion of metal under the cement.

For more information on B-H No. 1 Insulating Cement and other B-H Insulations, write for Catalog or see it in Sweet's Plant Engineering File.

BALDWIN-HILL



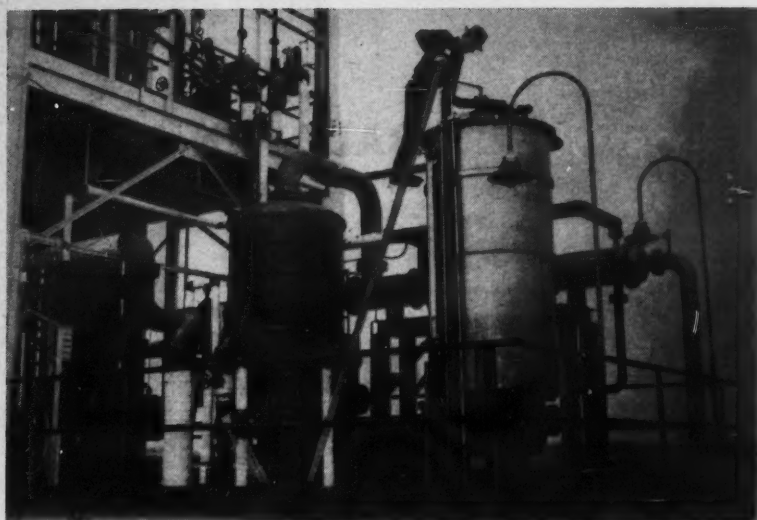
CONTRACT
APPLICATION
SERVICE
AVAILABLE

Company

401 Breunig Ave., Trenton 2, N. J.
Kalamazoo, Mich. . . Huntington, Ind. . . Temple, Tex.



Check 3229 opposite last page



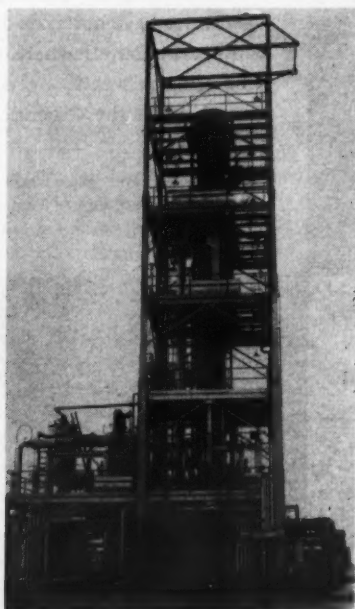
Vacuum-flash evaporator (left center) and dilute salt solution tank

Plant using process employing magnesium nitrate as a desiccant in place of sulfuric acid —

PRODUCES

99% Nitric Acid Free of Sulfates

GORDON WEYERMULLER,
Associate Editor
with **ROBERT J. BECHTEL,**
Engineer
Hercules Powder Co., Parlin, N. J.



Dehydration tower of nitric acid concentrating unit

A 50-ton/day nitric acid concentrating unit which went on stream in June 1957 at Hercules Powder Company employs a recently patented process which permits plant to produce 99% nitric acid in normal production compared to 97% by conventional manufacturing methods. This 50-ton/day unit will increase capacity of Hercules plant to 200-tons/day of nitric acid.

Basic difference between this process and conventional method is the use of magnesium nitrate as a desiccant in place of sulfuric acid. One advantage of this procedure is a product completely free of sulfates.

Plant uses trays rather than the conventional packing in tower. This among other things has meant a reduction of 20-30% in capital investment for unit. Elimination of the packing makes it possible to design a single column of much larger capacity. Operability factor is also materially improved.

Process uses a vacuum-flash evaporator in the water removal step. In order to avoid corrosion, several different types of construction materials were used in plant — includ-

ing stainless, aluminum, carbon steel, and other alloys.

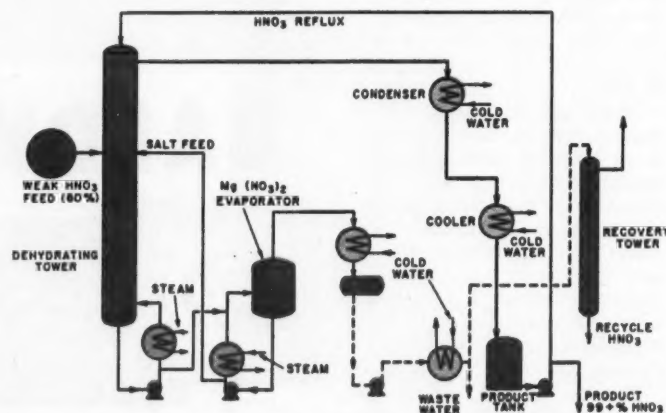
Process

Here is a specific example of how the process works: a 60% nitric acid solution is fed to the stripping section of a fractional distillation zone at an intermediate point in the upper portion of the stripping section. A 72% solution of substantially pure magnesium nitrate is introduced to the stripping zone at a point between the point of introduc-

tion of the weak nitric acid solution and the top of the stripping section.

Vapors containing about 87% nitric acid and the balance water are passed from the top of the stripping section to a point near the bottom of rectification section. Overhead product from the rectification zone is passed through a suitable condenser and a portion of this product is recovered as 99% nitric acid.

Unrecovered portion of the product is recycled to the rec-



Flow sheet of process for concentrating nitric acid with magnesium nitrate

tification zone. Bottoms product from the rectification zone, containing 75% nitric acid and 25% water, is recycled to top of stripping section.

A portion of bottoms product leaving stripping section is passed to a reboiler where it is heated to provide the necessary steam for the fractional distillation. Remaining bottoms product from stripping section, containing primarily about 68% magnesium nitrate and 28% water, is passed to a vacuum evaporator to drive off a portion of the water and concentrate the magnesium nitrate. Resulting 72% magnesium nitrate solution is then recycled to the stripping section for further use in the fractional distillation process.

(License on nitric acid concentration process can be obtained from Hercules Powder Company, Wilmington 99, Delaware.)

Check 3230 opposite last page.

(Nitric acid concentration plant at Parlin, N. J. was engineered and built by Badger Mfg. Co., 230 Bent St., Cambridge 41, Mass. Badger can also make licensing arrangements.)

Check 3231 opposite last page.

Starch Hydrolysis

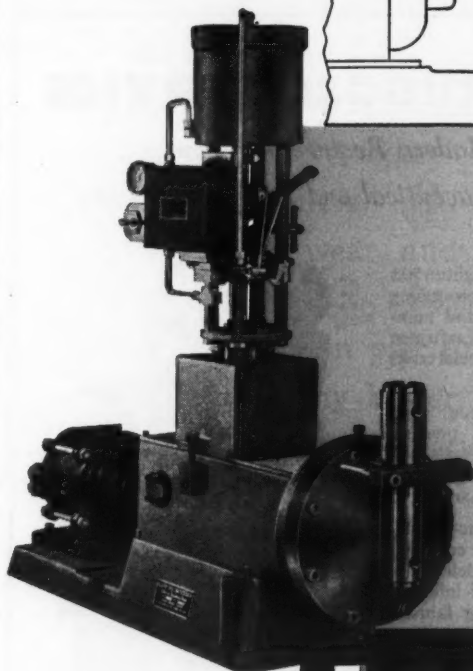
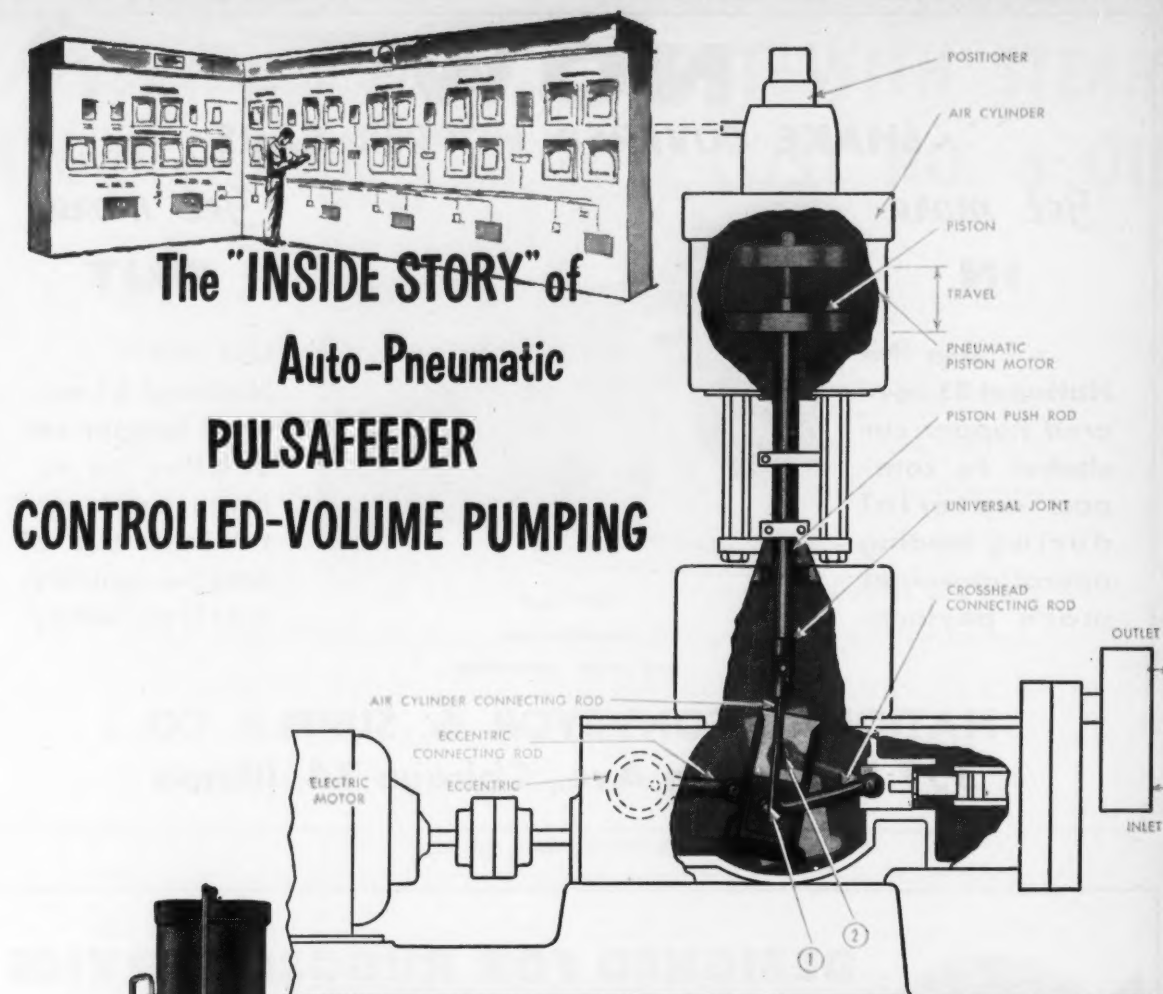
From page 37

sistent batches of partially hydrolyzed smooth starch paste every 15 minutes — compared to 2 to 3 hours by old method. Operating essentially automatic, machine produces top-quality product with minimum labor.

Unit is flexible too. Varied viscosities can be produced by simply changing time and temperature relationships. In operation for over a year, machine has required little, if any, maintenance.

(Packaged Entrodyne heat exchangers are product of General Equipment Mfg. Co., Inc., 1348-54 Stadium Drive, Indianapolis 7, Indiana.)

Check 3232 opposite last page.



In many industrial processes, liquids must be metered in relation to some changing process condition. It can be a change in flow or pH, temperature or pressure. Instruments can sense such a change and transmit an air signal descriptive of that change. The auto-pneumatic control mounted on the Pulsafeeder pump receives and interprets this signal and automatically adjusts pump to meet the process variable. This is accomplished by a positioning device on the auto-pneumatic control that loads or unloads the air cylinder, accurately moving the air piston to position the connecting rod (1) in relation to the axis (2). This determines the stroke length of the pump—a longer stroke increases pump output; a shorter stroke reduces output. Instrument air pressure over a range of 3-15 psig. controls Pulsafeeder output from 0-100% of capacity. Ratio adjustment is available in all models.

WRITE FOR BULLETIN 440 with typical applications, flow charts, description and specifications of both MANUALLY CONTROLLED and AUTO-PNEUMATIC models of various capacities and constructions. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Div., 3505 Poplar St., Le Roy, N. Y.

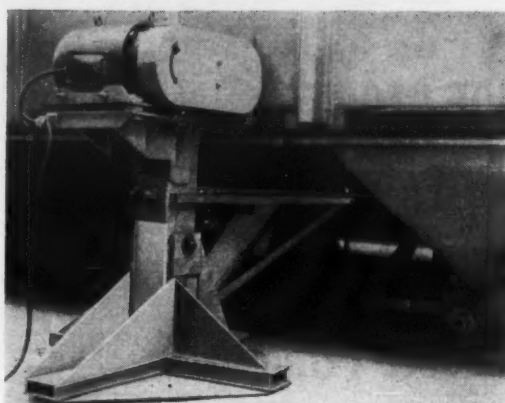
Lapp

Check 3233 opposite last page

NOW SHAKE COVERED HOPPER CARS

Get more
IN

Use the
National 81 covered
hopper car
shaker to com-
pact material
during loading
operations—get
more payload.



Pat. Pend.

low cost
trouble-free
one man operation

Get more
OUT

Use the
National 81 cov-
ered hopper car
shaker to vi-
brate bulk ma-
terials out of
cars — quickly,
easily, safely.

NATIONAL CONVEYOR & SUPPLY CO.
357 N. Harding Ave., Chicago 24, Illinois

Check 3234 opposite last page

NEW SOLUTIONS

**Mills, products protected
against metal particles
by electromagnetic field**

Spots even minute magnetic
and non-magnetic objects

A low cost, simple device,
operating on principle of elec-
tromagnetic field, is guarding
expensive mills and products
against damage and contami-
nation from foreign metallic
particles at Eli Lilly and Com-
pany, Indianapolis, Indiana.
Eliminating the human ele-
ment from the inspection
process, unit spots magnetic
and non-magnetic, ferrous and
non-ferrous metal particles,



CP Staff Photo

Unit mounted above conveyor sets
up electromagnetic field, automati-
cally operates signaling device and
stops conveyor when metallic objects
pass through

even though they are ex-
tremely minute and hidden
from view.

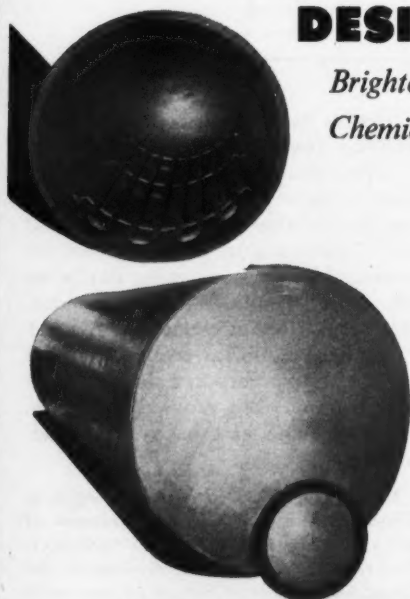
Mounted above a 2-ft wide,
rubber, endless-belt conveyor,
the instrument continuously
scans incoming bulk botanical
products, roots, bark, leaves,
etc., prior to their being fed
to the various grinding mills.
Products are later used to
make botanical drugs.

Fully automatic, the detec-
tor provides complete protec-
tion, even at high conveyor
speeds. As material passes
through inspection aperture of
the unit, it is exposed to a
high-frequency electromag-
netic field.

Presence of metallic objects
causes reaction in the field,
actuating a signal, which in
turn, is amplified to operate
signaling device and stop
conveyor. Sensitivity level
may be adjusted to suit re-
quirements. The metal object
is removed manually. Convey-

DESIGNED FOR RUGGED SERVICE

*Brighton Fabrications Meet Modern Requirements for . . .
Chemical, Food, Paint, Pharmaceutical and Allied Processors*



For more than four decades Brighton has
fabricated equipment for the processing
industry. From our modern and com-
pletely equipped plant, Brighton craftsmen
build small tanks, large tanks, special tanks
from all types of alloy metals.

Typical fabricating jobs include: frac-
tionating columns, reactors, pressure
vessels, (jacketed or unjacketed) coils, agi-
tators, kettles, tanks, evaporators. Special
machines weld, bend, flange, roll and form.

Brighton fabricates according to ASME
code requirements. For creative engineer-
ing, craftsmanship and on time delivery of
equipment, write for complete informa-
tion. Prompt estimates on your fabrica-
tion requirements.

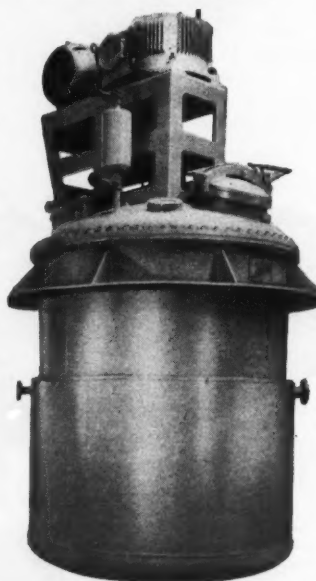
BRIGHTON

METALSMITHS
EST. 1914



CORPORATION

820 STATE AVENUE • CINCINNATI 4, OHIO



Check 3235 opposite last page

or is re-started by simply pushing a button.

Similar units may also be installed to operate either automatic or semi-automatic rejection equipment, or any other combinations of controls.

(RCA Metal Detectors are product of Radio Corporation of America, Camden 2, N.J.)

Check 3236 opposite last page.

**Patent granted
for continuous
tall oil process**

**Makes tall oil as byproduct
in paper mills**

Process has been patented for continuous production of tall oil as byproduct in manufacture of paper pulp. Advantages claimed over existing processes include: lower investment in equipment when replacing expensive corrosion-resistant gravity-type settlers; reduced space requirements; and improved quality of tall oil.

Basic process consists of continuously reacting a proportioned amount of diluted sulfuric acid with black liquor skimmings. Mixture is screened, gas released, and product sent to nozzle-type centrifuge where tall oil is separated from the waste products.



Improvements and variations have been added to the basic system. These include use of waste sulfuric acid which is available in mills using sulfuric acid-chlorine dioxide pulp bleaching process; modification of centrifugal equipment to permit elimination of screening; simplified operation; and longer equipment life.











First plant to use process was installed in 1956. Modifications of the original design have been made for additional installations. Process is available to interested companies on royalty basis.

(Further information about tall oil process may be obtained from The De Laval Separator Company, Poughkeepsie, New York.)

Check 3237 opposite last page.

Powermaster® . . . FIRST WITH STEAM ATOMIZATION FOR LOW-COST NO. 6 OIL

Here's vital, dollars-and-cents news for the medium-sized user of process steam.  Orr & Sembower has developed a new steam atomizing burner for POWERMASTER packaged automatic boilers that breaks down the heaviest #6 oils into clean-burning fog.  You can save up to 2c or more per gallon by burning #6 oil instead of #5 oil . . . cut fuel bills \$16,000 on an annual consumption of 800,000 gallons.

 The O&S steam atomizing burner is tailored for industries such as dairies, food and chemical processors, textile and metalworking plants.  Available in complete POWERMASTER packaged boiler units from 40 hp to 600 hp and as a separate burner system.  No comparable atomizing system for packaged fire tube boilers has been available before from any manufacturer.  The new O&S burner gives freedom from operating difficulties to a degree never before experienced except in large, expensive field-erected boilers.  The rugged burner has no moving parts to clog or wear, and steam scrubbing action keeps the nozzle clean.  Cost?  A steam atomizing POWERMASTER can pay for itself in less than two years.  Know of any better plant investment?  Frankly, we don't.  Suggestion: Write, wire or phone us today for the complete story.

ORR & SEMBOWER, INC.

960 MORGANTOWN ROAD
READING, PA. • Since 1885

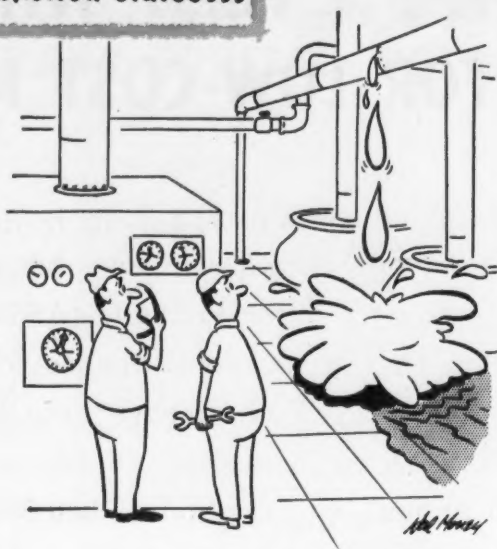


Powermaster PACKAGED AUTOMATIC BOILERS

Check 3238 opposite last page

Life in these excited states...

"I can't stand that constant drip-drip-drip!"

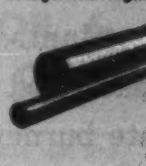


Corrosion got the drop on you?

Little drips can mean big losses... repairs, downtime, ruined equipment. You can put an end to 85 to 100% of these problems with Ace chemical-resistant rubber and plastic piping, valves, pumps, tanks and other equipment. American Hard Rubber Company's 108 years of experience is at your service.

All-purpose rigid PVC. Sched. 40, 80 & 120, 1/2 to 4". Threaded or socket-weld fittings. Valves 1/2 to 2". NSF-approved. Bul. CE-56.

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Improved design... now 12 gpm. All wetted parts acid-resistant, wear-resistant Ace hard rubber. Finest available. Bul. CE-55.

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ACE Gear Pump



Flexible poly pipe, ideal for water lines, drains, underground pipe or conduit. Sizes 1/2 to 2", long coils, NSF-approved for drinking water. Bul. CE-57.

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World's best chemical valves... at moderate prices. All-plastic, rubber-lined, or all-hard-rubber. 1/4" pet cocks to 24" gate valves.

VALVE
HEADQUARTERS



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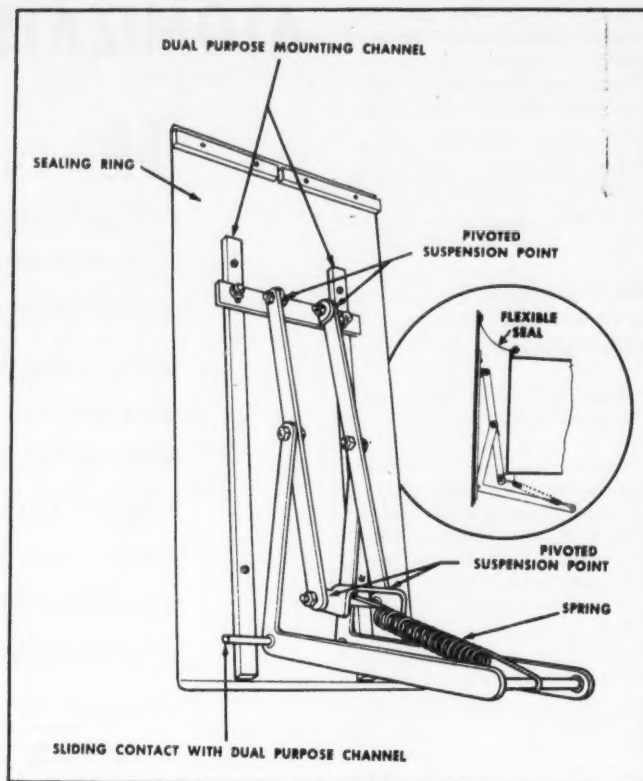
processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY
DIVISION OF AMERACE CORPORATION
Ace Road • Butler, New Jersey



Check 3239 opposite last page

NEW SOLUTIONS
of processing problems



Providing maximum protection with minimum maintenance, low-cost, easy-to-install seals at Shell . . .

Boost efficiency of floating-roof tanks

TED. F. MEINHOLD
Associate Editor
with **FRED W. ROOD**
Assistant Chief Engineer
Shell Oil Company
Wood River, Illinois

before accurate cost evaluations can be made, results to date indicate that the units are providing maximum effectiveness at lower initial and upkeep costs than conventional floating-roof seals.

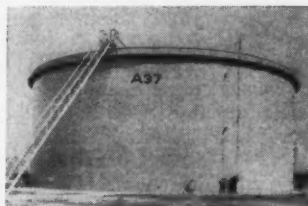
Used in gasoline storage service, the seals are installed on three 120' diam x 48' high tanks, one 140' x 48' unit, and a small 20' x 24' research lab tank. Latter is used to store highly aromatic research fuels. Initial seal installation was made about two years ago. None of the units have re-

New economies in operating floating-roof tanks are being realized through use of low-cost, simply-designed, easy-to-install seals at Shell Oil Company's Wood River, Illinois, refinery. Although it may take another five to six years

CHEMICAL PROCESSING

Permaglas® Storage Structures eliminate packaging costs

Two-point suspension seal hanger has one pivoted and one sliding point of contact. Device exerts uniform outward pressure over entire height of shoe, eliminating local (spot) abrasion and assuring long service life with minimum maintenance. Inset shows side view of installed unit



Large 120' diam x 48' floating-roof tank at Shell's Wood River, Illinois, refinery is used to store high octane gasoline. Seals on tank have required no maintenance since they were installed over two years ago

quired any maintenance as yet.

Shell's engineers frankly admit, that although they were impressed by the seal's simple and efficient design, the unit's relatively low initial cost was what "sold" them. The seal is flexible in its application. It can be installed on either new or existing double-deck, pontoon, and pan-type roofs, as well as any floating-roof type tank. It can also be adapted, in a modified shoe design, in existing riveted tanks.

Two-point Suspension Used

The seal, a conventional shoe-type, is distinguished from other seals by the simplicity and effectiveness of its two-point suspension hanger. Device exerts uniform outward pressure over entire height of shoe, providing maximum sealing action and improved radial alignment. Local (spot) abrasion is eliminated; and longer, better service is assured at minimum maintenance cost.

All working parts are below tank's liquid level, thus protecting them from corrosive vapors, and leaving roof deck free from undesirable obstructions.

To next page

Texas Corporation maintains contamination-free operation in changing from costly packaging to economical bulk handling.

Towering above the flat Texas Plain at Big Spring—four Permaglas Storage Structures testify to the wisdom of the change from packaged to bulk materials-handling and storage.

Specified by Blaw-Knox engineers, materials-handling consultants for a wide variety of industries such as foodstuffs,

chemicals, feed ingredients, rubber, plastics and pharmaceuticals—the Permaglas Structures met all requirements. These steel structures—glass-protected inside and out* safeguard products from contamination and discoloration... and are ideal for storing bulk materials—granular, flaky, pulverized, hygroscopic, contaminable, edible or non-edible.

Delivered and erected quickly at low cost, the Permaglas Structures require little maintenance—no need for painting.

Permaglas system planning service helps you evaluate your materials-handling methods. The Permaglas man in your area will work with you and your staff to give you a complete and factual description, cost summary and recommendation on your present or future materials-handling system. The Permaglas Service includes data on A. O. Smith's exclusive mechanical sweep-arm bottom unloader for complete mechanization of your bulk handling and storage operation.

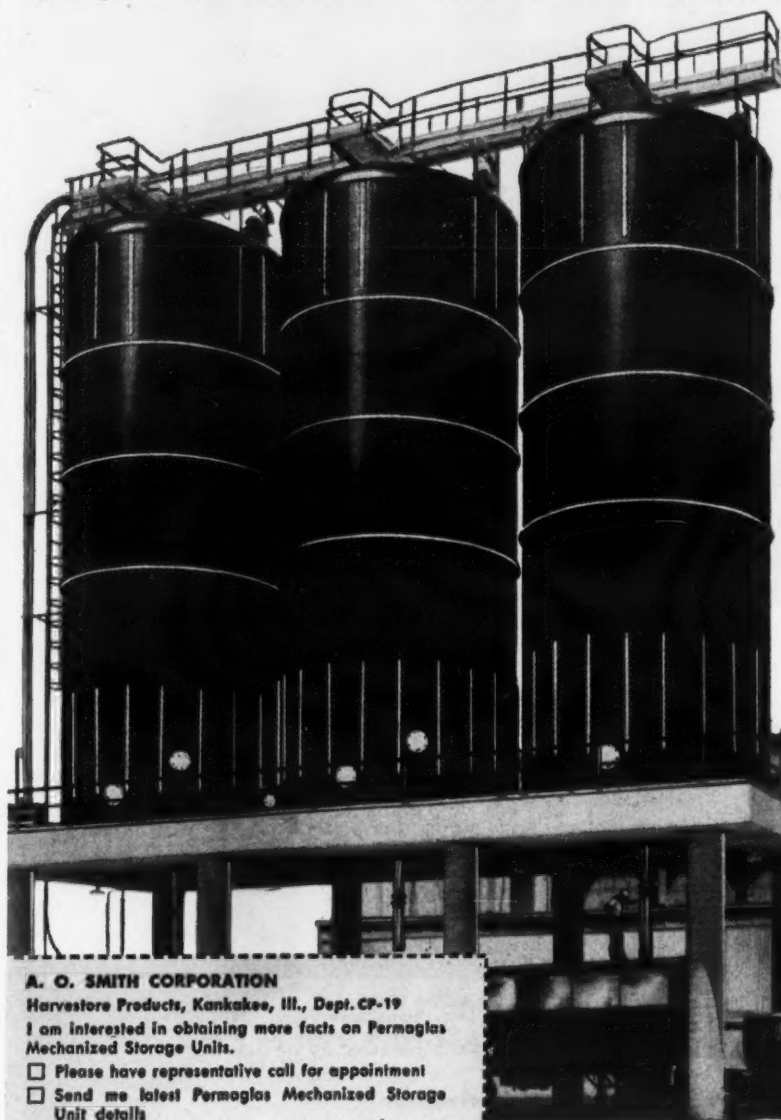
* HYDRASTEEL PROCESS covered by U. S. Patent No. 2,754,222

Through research... a better way

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HARVESTORE PRODUCTS
Kankakee, Illinois

A. O. Smith INTERNATIONAL S.A., Milwaukee 1, Wis., U.S.A.



A. O. SMITH CORPORATION

Harvestore Products, Kankakee, Ill., Dept. CP-19

I am interested in obtaining more facts on Permaglas Mechanized Storage Units.

- ☐ Please have representative call for appointment
☐ Send me latest Permaglas Mechanized Storage Unit details

Name

Firm

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City Zone State

Cosden Petroleum Corporation's three 20' x 50' Permaglas Bulk Storage Structures are loaded by pneumatic conveyor. They discharge 1/2" cube polystyrene molding pellets by gravity into bulk transfer trucks below. A fourth 14' x 15' Permaglas Structure safely stores crumb rubber.

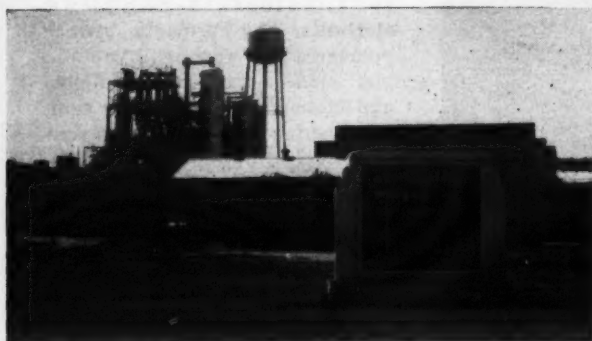
Check 3240 opposite last page

at American Synthetic Rubber Company

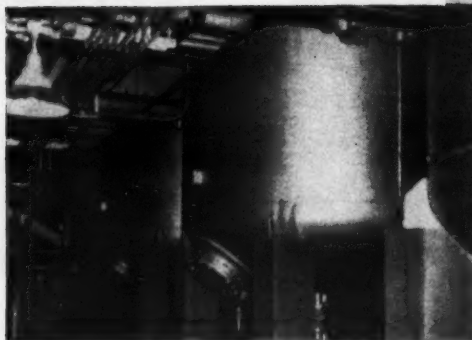
EFFICIENCY IS PARAMOUNT!

Yes, and for custom plate fabricated code tanks and pressure vessels, there's no substitute for experience. Modern Welding Company is proud to contribute to the progress of successful chemical processors.

Horizontal Latex Blow-Down Vessel
11' ID x 25' TL, 34" heads, 1 1/4" shell, 3 manholes, 14 nozzles, 2 sight glasses.



Styrene Stripping Column
10' OD x 50' 7" TL,
1 1/4" heads, 1/2" shells, 14 internal stainless steel perforated trays, 16 manholes, 15 nozzles, 8 sight glasses.



Top and Bottom View,
Vertical Latex Blow-Down Vessel
10' OD x 9' 6" TL, 1/4" heads, 1/4" shells,
19 nozzles, 3 manholes, 85 WP with full vacuum.



ALL TANKS A. S. M. E. CONSTRUCTED

MODERN WELDING COMPANY
INCORPORATED

Owensboro, Kentucky

NEWARK, OHIO • ORLANDO, FLA. • HOUSTON, TEXAS • BURLINGTON, IOWA

Check 3241 opposite last page

NEW SOLUTIONS

From preceding page

Standard shoe material is galvanized steel, although units can be made of stainless steel or other special materials of construction, if required. Standard shoe thickness is 14-gage, but units are also available in thicknesses as heavy as 10-gage.

Each seal hangar has one pivoted and one sliding point of contact with the dual-purpose mounting channel to which it is attached (see drawing). Channel serves: 1) as means of attaching seal hangar to shoe — without direct contact of seal hangar to shoe, and 2) as method of providing even distribution of the forces of the seal hangar over entire height of shoe.

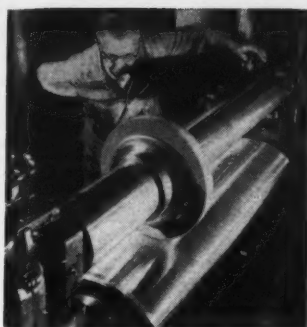
By means of a strong spring (stainless, carbon steel, or other alloy) and the lever action of the hangar, an outward horizontal force is applied to the channel at each contact point, and distributed throughout height of channel. Result is an even distribution of pressure throughout height of the sealing shoe as it is forced into contact with tank shell.

Installation is fast and efficient. Individual shoes are simply pinned into position against tank shell. The upper suspension point of the seal hangar is then attached to the shoes; the lower suspension point is then swung back into contact with the floating-roof and attached — thus eliminating costly layout on the floating roof to locate the seal hangars. The shoes provide a continuous sealing ring, with expansion joints at required intervals, supported and positioned by the hangars.

(Floating-roof tanks and tank seals were installed by Nooter Corporation, 1400 South Second Street, St. Louis 4, Mo.)

Check 3242 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.



Taking out nicks . . .

. . . and gouges from rolls on roller mills is no longer a tedious and time-consuming job, thanks to this portable grinder. Installed at Manifold Supplies Company, Brooklyn, N.Y., the unit has eliminated use of hand stones and other hand-held abrasives used in the past for this purpose.

Close tolerance grinding is also possible — without need of dismantling mill or sending rolls back to manufacturer. The portable grinder redresses rolls to within 0.00045" on roundness and straightness right on the mill.

("In Place" portable grinder was developed by B. S. Roy & Son Company, Worcester, Massachusetts.)

Check 3243 opp. last page.

Prevent contamination of ammonia solution during shipment

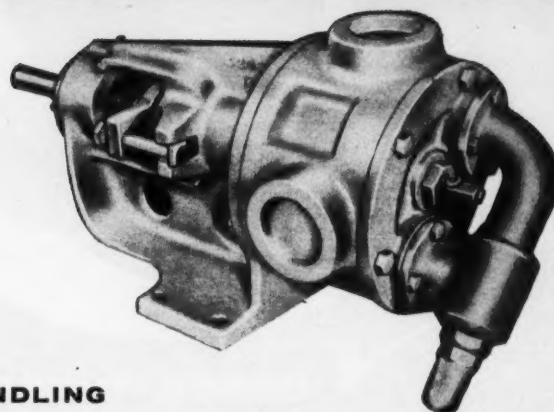
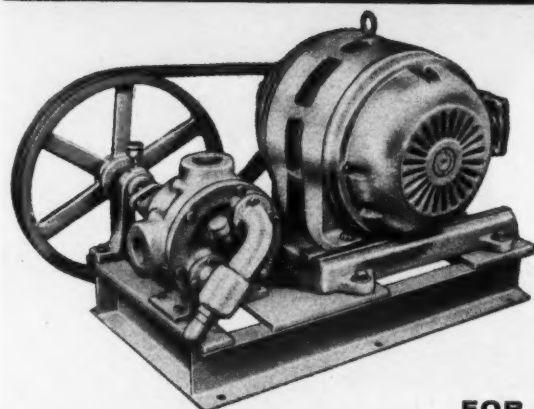
In order to protect expensive white printing equipment in which their ammonia developing solution is used, Reslabs, Inc., Division of Linco, Products Corp., (Chicago) must ship in containers that are not attacked by the solution. This would put harmful rust and minerals into the solution.

The company has recently started using a plastic-lined drum for these shipments—after extensive investigation of several types.

Cost, of course, had to be considered strongly in making the choice. Since Reslabs

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SOLVENTS • FUEL OILS • LUBRICATING OILS • CHEMICALS • ALKALIES

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You'll want to know more about the Deming Rotary Pump line! Send today for complete descriptive literature.

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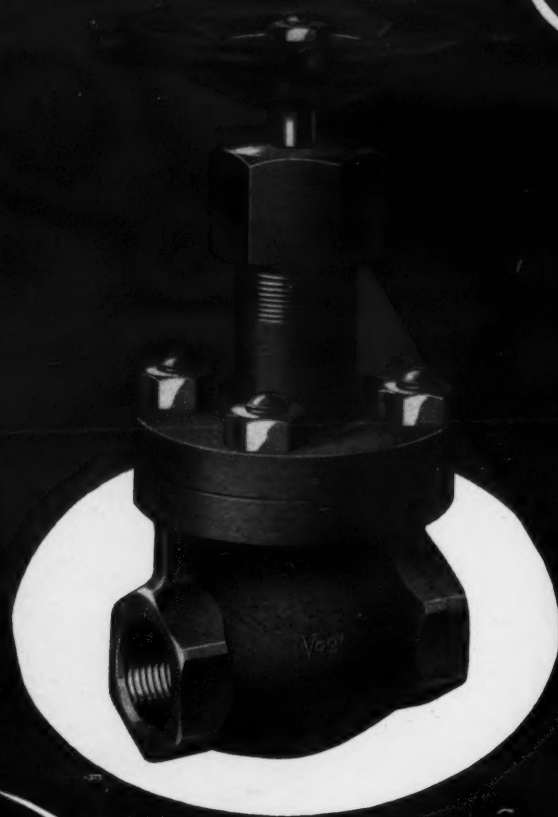
Send me
Literature on
the Deming
Rotary Pump
Line.

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ADDRESS _____
CITY _____ ZONE _____ STATE _____

Check 3244 opposite last page

Spotlighting

2 NEW VOGT VALVES



★
FORGED STEEL
INSIDE SCREW
Bolted Bonnet



GATE and GLOBE VALVES

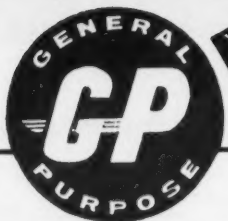
150-800 Pounds Service
2000 Pounds Cold, W.O.G.

Available from stock in
1/4" thru 2" sizes and in both
socket weld and screw ends.

CHECK THESE FEATURES

- 1 Forged steel pressure containing parts designed for light weight and brute strength.
- 2 Hard faced seats and hardened discs and wedges.
- 3 Spiral wound stainless steel or Monel gaskets to suit trim.
- 4 Extra deep stuffing box for long packing life.
- 5 Dished sure-grip handwheel.

Vogt



FORGED STEEL

VALVES

Write for literature Dept. 24A-FCP

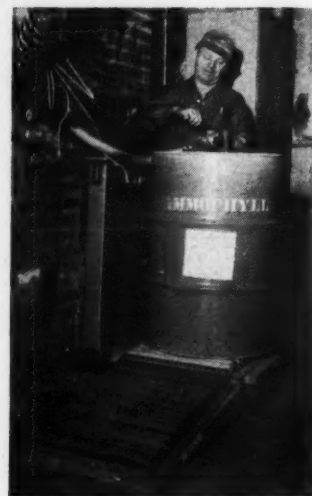
HENRY VOGT MACHINE CO., LOUISVILLE, KY.
SALES OFFICES

New York, Chicago, Cleveland, Dallas, Camden, N.J.,
St. Louis, Charleston, W.Va., Cincinnati

NEW SOLUTIONS

charged a standard deposit on its previously used shipping containers, it did not want an expensive container that would necessitate raising the deposit. A total of about 200 containers of the ammonia developing solution are shipped each week from Reslabs facilities in Chicago and other parts of the U. S.

Coincidentally, in the course of its investigations, Reslabs



Ammonia developing solution is protected from contamination by lining of 55-gal capacity metal drum being filled here

found a drum manufacturer who was testing linings for their suitability with ammonia solutions. Metal drums of 55-gal capacity, with a suitable protective lining applied directly to the interior, were fabricated for testing. These drums were equipped with stainless steel fittings.

After testing the drums for a period of six months under all conceivable handling conditions, Reslabs found them to be completely satisfactory. No trouble was experienced with the lining cracking, chipping, or peeling. The drums provided product protection from rust and mineral contamination. Their low cost eliminated the need for any raise in container deposit charges.

(Plastic-lined drum is product of Rheem Mfg. Co., 400 Park Ave., New York 22, N. Y.)

Check 3246 opposite last page.

Check 3245 opposite last page

THAT'S
INTERESTING

Polyethylene surgical mesh

High-density polyethylene surgical mesh seems answer to search for inert plastic prosthesis that sets up very little foreign-body reaction. Developed by Phillips Chemical Co., Marlex has been used during past year at Houston hospitals.

Snuff stuff

Maybe you think snuff went out with Sir Walter Raleigh—but 37 million lb of the stuff were consumed in the U.S. last year.

Who uses it? All kinds of people, including scientists working in laboratories where a lit match would mean disaster. Where did it come from? A Franciscan monk with Christopher Columbus discovered Indians inhaling its powdery form by drawing it into their nostrils through long hollow tubes. (Gentry Serenader, Gentry)

For more information on product at right, specify 3247 see information request blank opposite last page.



SPECIAL FITTINGS Need *NOT* Delay You

Midwest Can Make and Deliver

An exclusive and flexible manufacturing process enables us to make welding fittings of any material available in plate that can be worked and welded. As plate is more readily available than pipe, in special materials and thicknesses, deliveries are much better.

Elbows with special included angles, special tangents, special wall thicknesses and of special materials are easily and promptly made. Closer tolerances are inherent in the Midwest process. Quality control always exceeds code requirements . . . can be as comprehensive as you need.

Whether or not you use specials, Midwest Welding Fittings will do a better job for you. Consult your distributor, or write us for new Bulletin 5801.

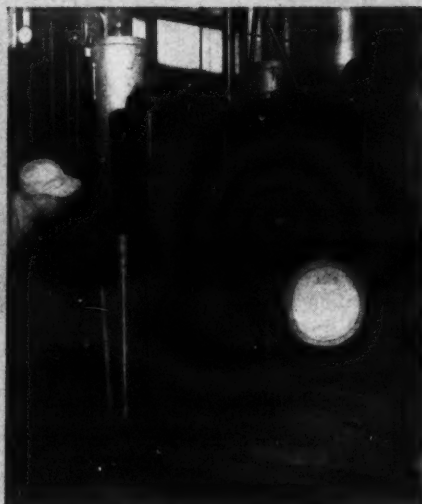
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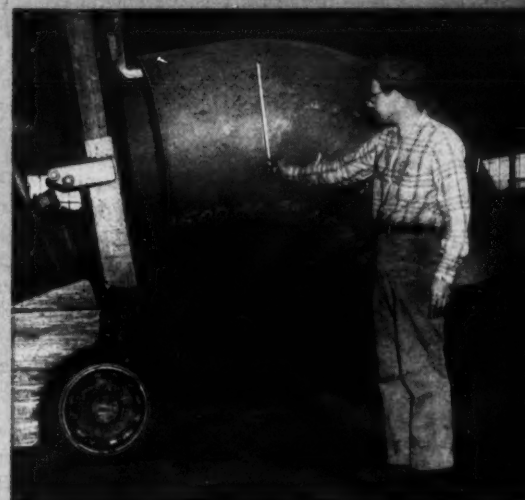
STOCKING DISTRIBUTORS IN PRINCIPAL CITIES



18" O.D. x 1 1/4" wall 90° elbows (2 1/4% chrome 1/2% moly) being sized in compression by totally enclosing dies. The exceptional dimensional accuracy that results is possible only with the Midwest process.



Entire interior and exterior surfaces of special stainless elbows for nuclear power plant are inspected with dye penetrant in search of microscopic surface imperfections. Elbows are 16" O.D. with 102° included angle and long tangent on one end.



Note the exceptionally long tangent on one end of this 36" O.D. 90° short radius elbow made of special carbon steel. Similar tangent could have been provided on other end if required.



Interior surface of 30" O.D. stainless steel welding elbow for liquid sodium nuclear system required a finish of 125 micro-inches or better.

MIDWEST

WELDING FITTINGS

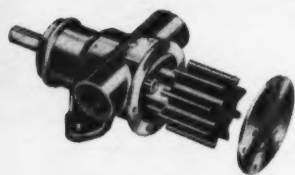
IMPROVE
PIPING DESIGN
and REDUCE COSTS

A FACTUAL REPORT ON...

JABSCO SELF-PRIMING CHEMICAL TRANSFER PUMPS

Jabsco chemical pumps are widely used wherever liquids, semi-solids and slurries are transferred. From the West Virginia Pulp and Paper Company, Luke, Md., comes this factual report: "We find your pumps extremely useful for laboratory and pilot plant work. We have pumped water, caustic soda solutions up to 50%, various other chemical solutions, chalk and pigment slurries up to 3% quite satisfactorily. The self-priming ability of the pumps makes the transferring of liquids from tank to tank a very simple operation as it is only necessary to switch the hose lines around as needed, no connections are needed to the tanks as the hoses are dropped in from the top."

Noel Obenshain, Research Engineer



Whether your pumping requirements are similar to Mr. Obenshain's, or quite different, chances are there's a Jabsco self-

priming chemical transfer pump perfectly suited to your requirements. Jabsco chemical pumps are manufactured in stainless steel, plastic, bronze, and cast iron and feature Jabsco's heat and wear resistant neoprene impellers.



Get your copy of Jabsco's chemical resistance chart today. Call your Jabsco distributor (see the Yellow Pages) or write direct to:

JABSCO PUMP COMPANY

1485 Dale Way, Costa Mesa, Calif.

Gentlemen: Please send information on Jabsco self-priming chemical transfer pumps and the Jabsco Chemical Resistance Chart.

Name _____
Company _____
Street _____
City _____ Zone _____ State _____

Check 3248 opposite last page

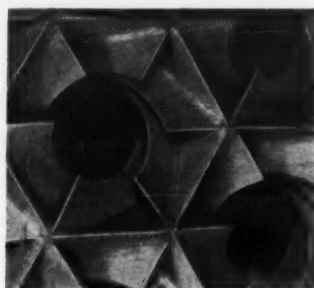
NEW SOLUTIONS

**Dust nuisance stopped,
uranium recovered,
with collector**

Operates at 6500 ft altitude,
is over 95% efficient

Problem: Dust losses were accounting for considerable uranium product loss and dust nuisance at the Durango, Colorado, plant of Vanadium Corporation of America. Located 6500 ft above sea level on a mountainside, the mill operates 24 hr per day, extracting the valuable metal from carnotite ore.

Points of greatest dust loss were at the conveyor inlets and outlets to rod mills, and at vibrating separators. With a planned expansion program in the works, engineers sought



Honeycomb design of dust collector's hexagonal inlet nozzles leaves no flat waste areas for dust deposits and tube-plugging

a dust collecting system with at least 95% efficiency and one that would give trouble-free, around-the-clock service.

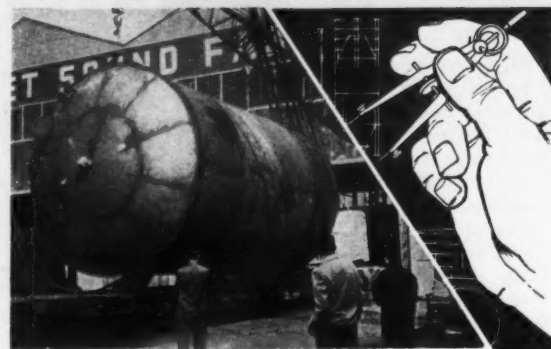
The unit would have to operate continuously. A few days of downtime could mean loss of several thousands of dollars — not to mention the dust nuisance, which is particularly severe with carnotite.

Solution: After investigating several types of equipment, engineers decided to install, on an experimental basis, a relatively new aerostatic-type, 25-tube dust collector.

Working with dust samples taken directly from the mill exhaust stack, dust collector manufacturer's engineers calculated overall efficiency of unit at 97.7%, based on flow of 8000 cfm and 6" wc pressure drop at elevation of 6500 ft and 70°F.

from blueprint plans
PUGET SOUND FABRICATES

PROCESS VESSELS



Nickel-clad caustic storage tank for western chemical plant
... for the Chemical Processing Industry on the West Coast.

You can save on transportation costs, manufacturing time and gain the dependability of over 58 years of custom fabricating experience when you call on Puget Sound as your West Coast source for process and plant equipment in steel plate and alloys up to 1". Send prints for prompt quotation on your next job.



Request Brochure No. M-58



**PUGET SOUND
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Craftsmen in Metals

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Check 3249 opposite last page

**Protects Metals Against
Hot Acids, Acid and Sulfurous
Fumes, Salt Spray
Steam,
Mild Alkalies
Up to 600° F.**



Markal "D-A" Coatings will protect metal against any corrosive action. It is an ideal product for ore sintering plants, plating plants, food

plants, lumber kilns, foundries, chemical plants, sewage disposal plants, laundries, heat exchangers . . . many others.

Markal "D-A" Coatings are applied by brush or spray and can be air dried or baked. The Coatings will withstand temperatures up to 600°F.

For free sample write on company letterhead, stating temperature extremes, surface temperature at time of application, and corrosive condition.

Other Markal Coatings are available in a complete range of types for any condition and temperatures up to 2200°F. Send for catalog No. MPC. The **Markal Company**, 3055 West Carroll Avenue, Chicago 12, Illinois, telephone Sacramento 2-6085

Check 3250 opposite last page

CHEMICAL PROCESSING

Under same conditions, but with smaller flow of 6575 cfm at 4" wc, overall efficiency was guaranteed at 96.7%. Both efficiencies were based on normal particle size distribution having 10% less than 10 and 30% less than 50 microns.

Unit's high efficiency is attributed to venturi-spiral vaned nozzles at inlet of each tube. Design causes an almost instantaneous six-to-one increase in gas velocity, greatly intensifying the tangential or outward thrust characteristics of the centrifugal action. Even the most minute particles, five microns and under, are ejected and collected.

The design also produces an even flow distribution over entire inlet nozzle area, preventing uneven areas of wear.

The unit went into service at the Vanadium plant in May 1957. Hoods, with ductwork leading to the dust collector inlet, were installed before and after the rod mills and at the vibrating separators. Two 10" blowers powered the overhead dust recovery network.

Results: The aerostatic dust collector is meeting all advance expectations. Dust losses have been cut to a minimum and the dust nuisance problem has been whipped. Whenever the unit is taken out of service for inspection, everyone in the mill complains.

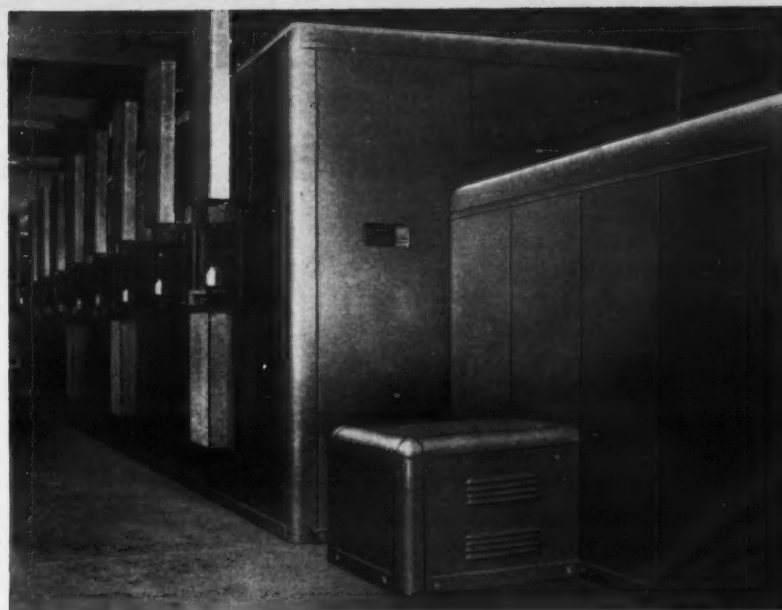
The collector has been opened up for inspection at least three times since going into operation. There have been no signs of wear or tube plugging, showing that unit is self-cleaning.

Final decision for selection of any additional units will depend on the collector's ability to withstand the severe service for a longer period of time. So far outlook is encouraging. The unit is less expensive than conventional high-efficiency collectors of similar capacity and in some installations has paid for itself within a week.

(Hagan aerostatic dust collectors are product of Hagan Chemicals & Controls, Inc., Route 60 at Campbell's Run Road, P.O. Box 1346, Pittsburgh 30, Pa.)

Check 3251 opposite last page.

"NATIONAL" PERFORATED APRON CONVEYOR DRYER



Evidence of the outstanding efficiency and economy of this "National" drying unit is found in the number of existing and on-order installations among the Nation's leading chemical manufacturers.

Increased drying capacity per square foot of surface; improved uniformity of dried product; much easier apron cleaning; greater efficiency and accessibility of gas or steam heaters; and a generally neater machine to operate and maintain, are characteristics of this drying system resulting from unique and exclusive features of "National" design, construction, operation and control.

The same type of dryer is used by the Nation's leading manufacturers of synthetic fibres.

The following well-known companies are among the current users of "National" Perforated Apron Conveyor Dryers:

AMERICAN VISCOSE CORPORATION
ARMOUR & COMPANY
THE PHILIP CAREY MANUFACTURING CO.
DAVISON CHEMICAL COMPANY,
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DU PONT COMPANY OF CANADA (1956) LTD.
E. I. du PONT de NEMOURS & CO.
THE GENERAL TIRE & RUBBER CO.
CONGOLEUM-NAIRN, INC.
O. M. SCOTT & SONS CO.

A. E. STALEY MANUFACTURING CO.
AMERICAN ENKA CORP.
NATIONAL ANILINE DIVISION,
ALLIED CHEMICAL & DYE CORP.
NATIONAL METAL EDGE BOX CO.
CANADIAN INDUSTRIES, LTD.
RADIO CORPORATION OF AMERICA
THE DOW CHEMICAL CORP.
CHEMSTRAND CORP.
UNION CARBIDE & CARBON CORP.

Write for Literature Describing These "National" Dryers and Typical Installations.

THE  DRYING MACHINERY COMPANY
LEHIGH AVE. and HANCOCK ST., PHILADELPHIA 33, PA.

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Steam? ... Dry Heat? ... Or Gas?

With the discovery of new media it is now possible to integrate sterilization into your production program. It is possible to sterilize materials which could be injured by dry heat or steam. And it is possible in many cases to sterilize the packaged product.

Castle engineers are prepared to discuss with you *any* sterilizing medium—whether new or conventional—that is best suited to your needs.

You will profit from the 75 years of research and experience behind the Castle Engineered Sterilization Program.

Send for this **FREE Brochure**

Shows how CES helps solve your sterilization problems. Presents latest developments in dry heat, steam and GAS.



STERILIZATION ADAPTED TO YOUR NEEDS

New CES makes gas available for terminal sterilization. This process enables gas to penetrate and sterilize the contents of sealed packages. The CES brochure supplies information on the economic use of gas sterilization.

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For more information on product at left, specify 3253 see information request blank opposite last page.



U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

Sodium Reduction Process Yields High-Purity Zirconium and Titanium

Outstandingly pure zirconium and titanium metals are being produced by means of a U.S.I.-developed sodium reduction process at the new Ashtabula plant of Mallory-Sharon Metals Corp.

Eighty per cent of the usual impurities in zirconium do not show up in spectrographic analysis of the sodium-reduced metal. Measurements of Brinnell Hardness Number, another indication of purity, show that the sodium-reduced zirconium has a value as low as 90-95, compared with about 70 for crystal bar zirconium—the industry's purity standard—and about 130 to 150 for metal produced by the magnesium reduction process.

The sodium reduction process has the additional advantage of low cost. Zirconium can be produced by this method for less than any other means. The process for crystal bar zirconium is too expensive to make the material competitive. The magnesium process costs

MORE

"Impossible" Alloys Now Made by Bombardment

In laboratory work sponsored by the Air Research and Development Command, normally incompatible metals are being combined by a new, high-temperature, high-speed bombardment technique. Microscopic particles of one metal are propelled by a "solid linear accelerator" to speeds of over 50,000 mph, and inserted into the crystalline lattice structure of the other metal.

Researchers believe that this new technique can be used to give materials new properties or to combine the desired properties of several materials. Aluminum alloyed with iridium particles to give it better high-temperature characteristics is cited as one example.

U.S.I. Products, Plants Detailed in New Brochure

The chemical industry can now get a complete picture of U.S.I. activities through a new company brochure available on request. This 40-page, full-color booklet covers:

- U.S.I. growth over the past eight years
- plans for the future
- affiliations with other companies
- products and where they are used
- type, number and location of plants
- research facilities
- sales service facilities

For your copy of "National Distillers and Chemical Corporation Expands in the Chemical Industry," address the U.S.I. Advertising Department on your company letterhead.

Chemical Makers Complete First Year of Continuous Promotion Of the Industry to the Public

Chemical Industry Activity Committees of MCA Report
Growing Progress on Local Level, Both in Participation by
Chemical Companies, and in Response by the Community.

In January the Chemical Process Industries will begin the second year of a continuous cooperative public relations effort sponsored by the Manufacturing

Chemists Assn. and carried out through local Chemical Industry Activity Committees (CIAC). This first year has been one of organization and idea-testing, combined with a gradual building up of local activity.

The program is now in operation in at least 380 communities and areas in 45 states. About 900 individuals in 150 companies are now equipped to work closely with local educational institutions, the press, radio and TV, community groups, organizations and clubs to acquaint the American public with the importance of chemistry in daily life.

The continuing program has been a natural outgrowth of the four Chemical Progress Week efforts. To quote General Hull, president of MCA: "Active . . . committees in a number of areas, believing that their community relations problems . . . were year-round and that they had an effective organization, have established continuing committees and have proposed that MCA sponsor a national program . . ."

Objectives of the Program

MCA feels that greater public understanding of the benefits of chemistry will also benefit the chemical industry. By building a good reputation for the CPI, MCA hopes to create a community climate of welcome for chemical enterprise, to achieve rapid acceptance of new products, and to attract top talent and more capital to the industry.

MORE

New Synthetic Rubber Made with Deuterium

Claimed more rubbery than rubber itself, a new experimental compound — cis,1,4-polyisoprene in which all hydrogen has been replaced with deuterium (heavy hydrogen) — is being studied for explanations of the elasticity and other properties of ordinary rubber.

The new deuterio rubber seems to be more elastic, apparently because the molecules containing deuterium atoms have less attraction for each other than molecules containing hydrogen. It is naturally heavier due to the presence of heavy hydrogen. It does not need carbon black for high tensile strength.

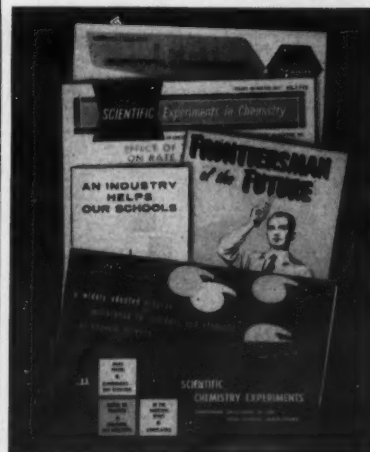
Studies of its behavior may explain, among other things, why rubber gives up and takes up heat during deformation and recovery, and may throw some light on the infrared absorption and crystallization of rubber.

Polyethylene Membranes Extend Polarographic Analysis to Gases

It is now possible to analyze gases by polarography, without dissolving them in a liquid, by introducing a semipermeable membrane between gas and electrode. The membrane substitutes for the liquid both as a diffusion layer and as an electrical contact. Polarographic current is directly proportional to the partial pressure of the gas.

Studies so far show that polyethylene is the best membrane material. Consequently, a cell consisting of a platinum working electrode, polyethylene membrane, and a salt bridge to a saturated calomel reference electrode, has been used in most of the research work to date. The cell will analyze oxygen or sulfur dioxide in concentrations from 100% down to 50 ppm, and should be suitable for continuous analysis and control of process streams, among other applications.

Other advantages of the polyethylene membrane: it prevents fouling of electrode surfaces; it is impermeable to ions and so eliminates interferences by reducible ions in the sample.



Samples of educational aids supplied by MCA.

U.S.I. CHEMICAL NEWS

CONTINUED

Chemical Promotion

What the Program Consists of

Well supplied with ideas and materials by MCA, the local committees have been exploring all possible avenues of communication.

Speakers Bureaus have been set up to contact local religious, educational, social, civic, business and other groups who would be interested in chemistry as it relates to their working and living experiences. These bureaus arrange for speakers and engagements, and supply material as needed.

Press Relations have been established with all newspapers to keep them informed on local happenings and general trends in the CPI.

Radio and Television people interested in material or personalities of local significance have been contacted. Resulting programs have included interviews, panel shows on local issues, broadcasts of special events, and educational and public service films.

Community Participation by the CPI in such events as fund drives, county fairs, chamber of commerce activities and civic improvement committees has been encouraged.

Direct Mail of MCA's Chemical News and other appropriate information to "opinion leaders" in the community has been undertaken.

Educational Activities have been voluminous. MCA has prepared comprehensive material to aid teachers and students. Industry-education meetings are held widely. Special workshops and seminars, essay contests, awards, scholarships and fellowships, study programs, guest lecturers, and so on and so on, have been set up.

More companies are joining in the second-year effort as direct benefits in terms of industry-community good-will become apparent. **More information is available from MCA Chemical Industry Activity Committees, 1625 Eye St. N.W., Washington 6, D.C.**

CONTINUED

Sodium Reduction

more to operate also and the zirconium does not have the purity advantage.

Sodium-reduced titanium is making an impressive showing too. All of the first month's

production at Ashtabula was blended and shipped as specification metal.

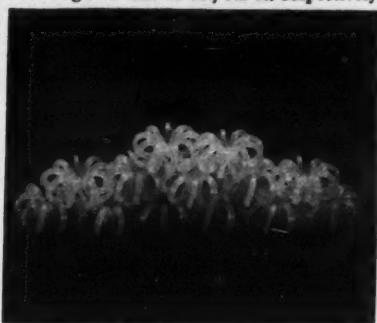
The purity achieved by sodium reduction can be attributed to several factors. The sodium, shipped from U.S.I.'s Ashtabula plant, is kept clean under argon blanketing. Brittleness is minimized in the resulting metals because oxygen and nitrogen are kept out.

Low-melting sodium can be handled as a liquid and therefore filtered and stored in the absence of air. As a liquid, it can be accurately pumped, metered and controlled. It does not alloy with zirconium or titanium.

Polyethylene "Rosettes" Ideal as Tower Packing

The Army Corps of Engineers has found that helically-wound polyethylene strip formed into toroidal "rosettes" makes a lightweight, sturdy, highly efficient packing for cooling towers. These polyethylene "rosettes" give 20-40% greater cooling efficiency at a pressure drop only 35% that of conventional packings of equivalent size. In addition, they are corrosion-resistant—unaffected by water and highly corrosive chemicals.

Used by the Army in a trailer-mounted water cooling tower — part of a mobile carbon dioxide generating plant — the polyethylene packings not only resist completely the shock of rough riding, but also cut down on the weight which must be transported. They weigh 10 lb./cu. ft. By comparison, fragile ceramic Rashig rings and Berl saddles of equivalent size weigh 48 and 45 lb./cu. ft. respectively.



Polyethylene "rosette" packings for cooling towers (photo courtesy Harshaw Chemical Co.).

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Stannic sulfide, a gold-colored powder with talc-like consistency, is now offered in pilot quantities. Suggested for use in varnishes and lacquers to gild and bronze wood, metal, paper. **No. 1420**

Polyethylene bottles with rotating sleeve to protect label are now on market. Horizontal channels for sleeve are molded around bottle. Label is inserted through vertical opening in sleeve, is held by channel, protected by sleeve. **No. 1421**

Natural vegetable hydrocolloid now available as coagulant aid, filter, selective ore flocculant in claimed nontoxic and edible, safe for use in settling drinking water, clearing waste water before return to earth or streams. **No. 1422**

Nuclear reactor experiments are described in new book now being sold. Prepared by staff of Argonne Nat'l. Labs., volume outlines problems of design, construction, operation of reactors; gives details of equipment and experiments. **No. 1423**

New aqueous base dispersant for uncured liquid epoxy and polyester resins is being marketed. Is solvent-free, nonflammable. Said to facilitate removal of residual resins from molds and equipment. **No. 1424**

Dry chemical fire extinguisher now available is claimed to deliver a 15- to 20-foot stream of fire-killing, heat-absorbing powder over a 60° arc. Powder is nontoxic, will not freeze, corrode or conduct electricity. **No. 1425**

New caulking compound, claimed both thermosetting and thermoplastic, is based on co-vulcanization of new synthetic elastomer with asphaltic compound. Said to be permanently flexible from -30 to 165°F. Adheres to all surfaces. **No. 1426**

New bench model infrared spectrophotometer has KBr prism, permits chemical analysis in the 12.5-25 micron region. Yields more complete quantitative and qualitative information on structure of compounds such as aromatic HCs. **No. 1427**

Water-thinned contact cement for plastic laminating and other rapid assembly work is now available. Contains no flammable solvents and is claimed completely safe. Said to produce instant, strong, creep-resistant bonds. **No. 1428**

Disposable polyethylene syringe for applying adhesives, potting compounds, etc. can now be obtained. Said to deliver exact quantities of fluid without flooding, starving or dripping. Capacity about 10 cc. of fluid. **No. 1429**

PRODUCTS OF U.S.I.

Alcohols: Ethyl (pure and all denatured formulas); Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL PR.

Organic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil, Ethyl Acetate, Normal Butyl Acetate, Diethyl Carbonate, DIATOL®, Diethyl Oxalate, Ethyl Ether, Acetone, Acetoacetanilide, Acetoacet-Ortho-Chloranilide, Acetoacet-Ortho-Toluidide, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate, ISOSEBACIC® Acid, Sebacic Acid, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P., Pelargonic Acid, 2-Ethyl Heptanoic Acid.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Riboflavin USP, Intermediates.

Heavy Chemicals: Anhydrous Ammonia, Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions, Phosphatic Fertilizer Solution, Sulfuric Acid, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sodium Sulfite, Sodium Sulfate.

PETROTHENE® Polyethylene Resins

Animal Feed Products: Antibiotic Feed Supplements, BHT Products (Antioxidant), Calcium Pantothenate, Choline Chloride, CURBAY B-G®, Special Liquid CURBAY, VACATONE®, Menadione (Vitamin K₃), DL-Methionine, MOREA® Premix, Niacin USP, Riboflavin Products, Special Mixes, U.S.I. Permadyr, Vitamin B₁₂ Feed Supplements, Vitamin D₃, Vitamin E Products, Vitamin E and BHT Products.



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**Valve reducing insert
standardizes bags,
pattern of pallets**

Problem: Bags of varying lengths and widths had to be ordered by Wyandotte Chemicals Corporation, Wyandotte, Mich., to package different forms of precipitated calcium carbonate. This stemmed from



Pasted valve reducing insert may be varied in size to fit different filling nozzles

difference in density of material. Thickness of filled bag was restricted to width of filling valve, which meant that bag holding 50 pounds of one product might have to be made longer or wider or both than another bag holding the same weight of another product. This resulted in conglomeration of pallet pattern at plant of Wyandotte Chemicals.

"Chimney stacking" of bags had to be employed in some cases (a hole left in center), causing waste in valuable freight and cargo space. Other pallets loaded with bags were too flimsy to be stacked high. Thin, long bags sagged at ends if picked up in middle, or buckled in center when picked up at ends.

Solution: Bag with pasted valve reducing insert was developed. It permits production of multiwall bag of standard length and width, but with thickness when filled that may range from 3½ to 6½ inches. Bag is 22½ inches wide, 25 inches long, and up to 6½ inches thick when filled. Thus the two dimensions governing pallet patterns (length and



Working wonders out of waste!

This quadruple-effect evaporator concentrates antibiotic liquids for E. R. Squibb & Sons, New Brunswick, N. J. Developed for the handling of streptomycin waste, it demonstrates Swenson's ability to help advance the production of new pharmaceuticals put into service for humanity.

Send for Processing Profiles, the authoritative new color booklet of perform-

ance reports! It shows Swenson products on the job . . . bringing higher efficiency and quality to all the processing industries. Remember, what Whiting's Swenson Evaporator Division has done for others can be done for you. *Swenson Evaporator Company, 15667 Lathrop Avenue, Harvey, Illinois.*



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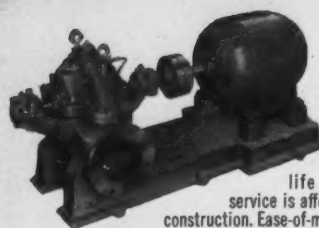
Proved Engineering for the Process Industries Since 1889



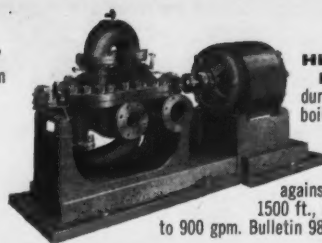
WHITING: MANUFACTURERS OF CRANES, TRAMBEAM HANDLING SYSTEMS, TRACKMOBILES, FOUNDRY AND RAILROAD EQUIPMENT.

Check 3257 opposite last page

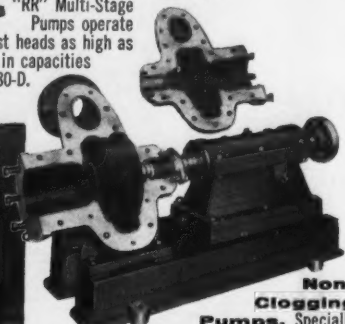
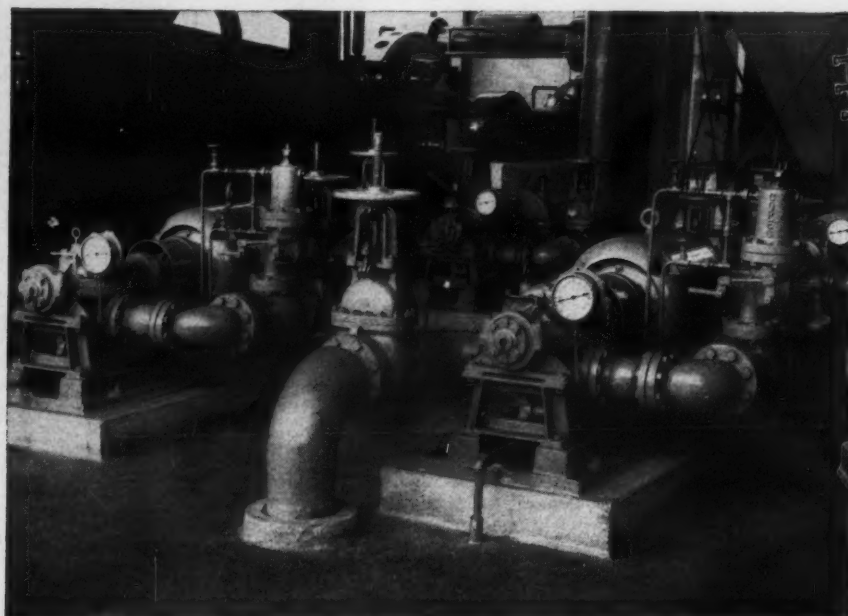
For more information on product at left, specify 3256 see information request blank opposite last page.



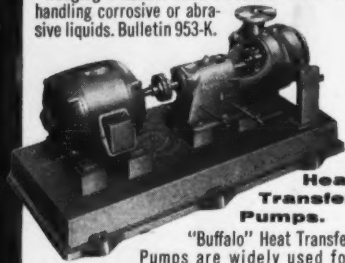
Clear Water Pumps. "Buffalo" Type "SL" Double Suction Pumps are designed for peak efficiency in clear water applications. A long life of economical service is afforded by their rugged construction. Ease-of-maintenance is a built-in feature. 10 to 14,000 gpm capacities. Bulletin 955-R.



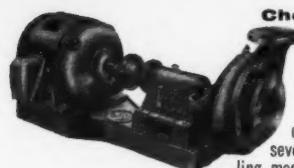
High Pressure Pumps. Offering efficiency, durability and dependability for boiler feed water and other clear water service, "Buffalo" Type "RR" Multi-Stage Pumps operate against heads as high as 1500 ft., in capacities to 900 gpm. Bulletin 980-D.



Non-Clogging Pumps. Specially designed for moving high consistency liquids, "Buffalo" Diagonally Split-Shell Pumps reduce down time, wear and "wedging". Rubber-lined models available for handling corrosive or abrasive liquids. Bulletin 953-K.



Heat Transfer Pumps. "Buffalo" Heat Transfer Pumps are widely used for handling high-temperature liquids. Ruggedly-built with special alloys, they utilize water-cooled bearings and packing. Efficient, single-suction, solid shell design. Write for application information.



Chemical Liquid Pumps. Choose from 10 special types of "Buffalo" Pumps in a variety of trim. Specially engineered for severe service in handling most corrosive, abrasive or high consistency liquids. Bulletin 982-A.

PUMPING EFFICIENCY TAILORED TO YOUR NEEDS

What are your liquid moving needs? Chances are, you'll find the right pump for your job from the complete "Buffalo" line.

You can rely on "Buffalo" Pumps to perform with maximum efficiency and dependability. Their rugged construction insures a long life of maintenance-free operation. Economy, too, is a big factor. For example, interchangeability of parts is designed into "Buffalo" Pumps through standardization. This saves you valuable dollars in lower parts inventories.

Add to these advantages the helpful services of the

"Buffalo" engineering team, and you have every reason to choose "Buffalo" Pumps for your particular needs. This engineering know-how is backed by more than 80 years of broad experience in solving liquid moving problems.

Whatever your pumping needs, call in your nearby "Buffalo" representative. He'll be glad to help you select the pump best-suited to your job. Or write us direct for full information and bulletins.

"Buffalo" Pumps bring you the "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.



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A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

Check 3258 opposite last page

NEW SOLUTIONS

width) are unchanged. Insert fits tightly to packing machinery spouts and is self-sealing, thereby avoiding spillage.

Results: Standardization of pallet patterns has been achieved regardless of density of packaged material. For-



Filled-bag thickness may change, but length and width of loaded pallet remains constant. New 3-2 arrangement of stacking is stable, compact

mer 2-1 pallet pattern has been discarded in favor of the more stable and compact 3-2 design. Bags can be high-stacked to make more efficient use of space in warehouse, truck and freight car.

(Multiwall bag developed by Owens-Illinois Glass Co., Toledo 1, Ohio, in cooperation with Wyandotte Chemicals Corporation.)

Check 3259 opposite last page.

WANTED: NOMOGRAPHS — WORTH \$20 EACH!

Do you have a pet nomograph that could save time for other **CHEMICAL PROCESSING** readers? If so, send it neatly and accurately drawn, with a double spaced, type-written description to:

Data Editor

CHEMICAL PROCESSING

111 E. Delaware Place

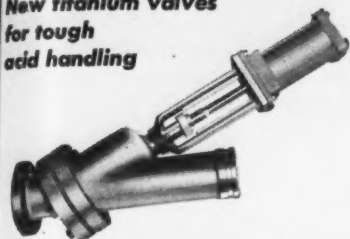
Chicago 11, Illinois

We will pay \$20 for each one accepted and published.

CHEMICAL PROCESSING

PROCESS PIPING POINTERS

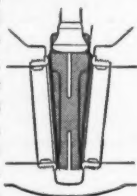
**New titanium valves
for tough
acid handling**



Newest example of special development for severe corrosive-erosive fluid handling is this 5-in. cast titanium globe valve for service involving an acid slurry. Seat and disc are ceramic material. Y-pattern body gives desired flow-through and seat tightness characteristics. Designs developed include both hand-wheel-operated type and cylinder-operated as shown. For more information, see below. Please mention titanium valves.

New flexible wedge disc holds tight at both seat faces

Available in steel gate valves, this disc provides positive seating at both seats — upstream and downstream. It also prevents sticking when valve is closed hot and opened cold. Read the performance report on 42 of these flexible disc valves at a big Texas butadiene plant: Not a sign of leakage across seats after more than 16 months' tough service. See next page.



What valves for guided missile and rocket fuel services?

This book tells what's available

This is not a catalog but a basic data guide to selection of valves for use by missile fuel manufacturers... and valves for handling fuels and other fluids at launching pads, testing stations and operational bases. Includes all specification and ordering data. Registered copies supplied free on qualified requests. Ask for "Valves for Guided Missile and Rocket Services." See below.



**For literature or data on product
listed above, please contact
J. E. Bradbury, Manager,
Chemical Sales Dept. No obligation.**

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Check 3260 opposite last page

JANUARY 1959



processing and engineering data

246

Water Vapor Permeability of Foams

R. R. DIXON

Westinghouse Electric Corporation
Columbus 16, Ohio

In the measurement of water vapor transmission of plastic foams, ASTM C-355 and E-96 are frequently used.

Basically the procedure is to seal the foam onto an impervious container containing a desiccant. This assembly is then stored in a high humidity chamber and is weighed periodically to determine weight change.

When this change is plotted against exposure time, a curve is obtained which eventually becomes a straight line. Slope of straight line portion is the rate of flow of moisture through the foam barrier.

The permeability of the foam is expressed by:

$$p = \frac{2352WL}{A \Delta P}$$

where

W = weight of moisture passing through
foam, g

L = foam thickness, in

A = area of foam sample, sq in
t = days during which W was measured
 ΔP = vapor pressure drop across foam, mm
Hg
2352 = conversion constant to give p in perm-
inches

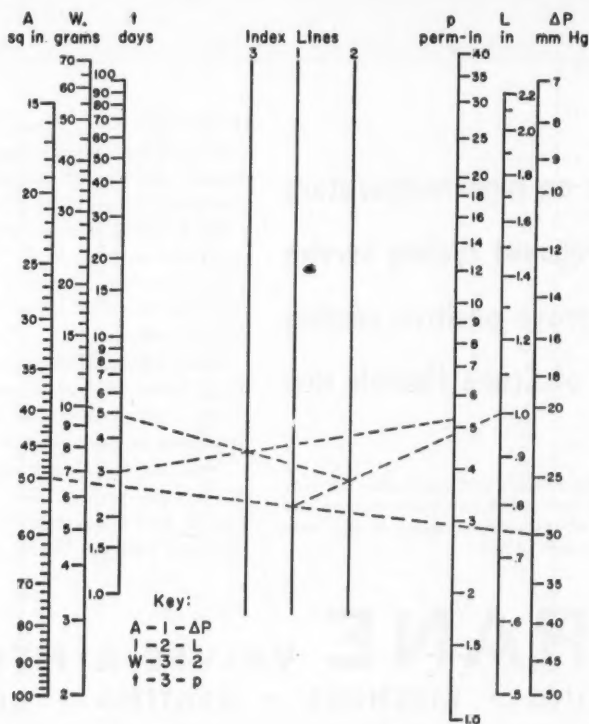
TYPICAL EXAMPLE

Foam of 50 sq in is exposed with a 30 mm Hg pressure drop. Line connecting these points intersects Index line 1.

Once test procedure is established, this point on Line 1 should not vary!

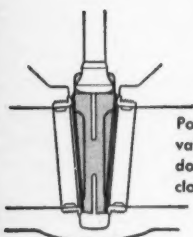
This point connected to a foam thickness of 1.0 in gives a point on Index Line 2. A line from here to a weight increase of 10 g gives a point on Index Line 3.

This point connected to a time interval of 3 days projects to a permeability value of 5.2 perm-inches.





**Big valves on high-temperature
ultra-frequent cycling service
prove positive seating
of Crane flexible disc**



Positive seating principle of Crane flexible disc gate valves. Holds tight at both seat faces—upstream and downstream. Also overcomes sticking of disc when closed hot and opened cold.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

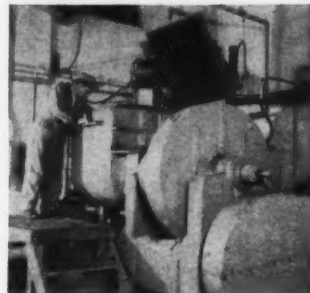
Since 1855—Crane Co., General Offices: Chicago 5, Ill.—Branches and Wholesalers Serving All Areas

Check 3261 opposite last page

NEW SOLUTIONS

**Solid fuels processed
speedily and safely
with big mixers**

Problem: A safe and efficient way of mixing ingredients in the production of specialized ammonium nitrate-based solid propellant fuels was required by engineers at Amoco Chemicals Corporation, Seymour, Indiana.



Big mixer handles 800-lb batches of solid propellant fuels without difficulty

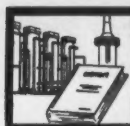
The mixture, a tough, doughy-like mass, had to be heated and mixed under rigidly controlled conditions. Once dispersed, mixture begins to liberate heat at rapid rate. It must then be cooled and maintained within proper temperature limits.

The fuel produced is reported to have several advantages over other solid propellants. Although process details have been kept under wraps, process is known to yield a fuel that is highly efficient and can be molded into any desired shape or size at moderate temperatures.

Solution: Engineers selected four 100-gal (800-lb) working capacity, batch-type, J. H. Day dispersion mixers for the job. Designed for heavy duty use, units are equipped with powerful 75-hp drive, and have jacketed, stainless-steel mixing chamber and cored "Z"-type agitator blade to assure accurate temperature control. Mixers are also designed to operate under vacuum.

Entire mixing operation, except for filling and unloading, is conducted by remote control. Units are tilted by electrically-operated mecha-

To page 56



Boiling Point Correction

GERALD A. LESSELLS

Olin Mathieson Chemical Corp.
Brandenburg, Ky.

Boiling point of a pure liquid near atmospheric pressure can be corrected to atmospheric pressure by following relationship¹:

$$\Delta P = \frac{\Delta t}{(1+273)(0.00010)}$$

Where ΔP , mm Hg = difference in barometric pressure from 760 mm Hg absolute
 Δt , °C = difference in observed boiling point from atmospheric boiling pt
 t , °C = observed boiling point
 and ΔP and Δt have same sign.

This relationship is solved in nomograph constructed by methods of Rhoden².

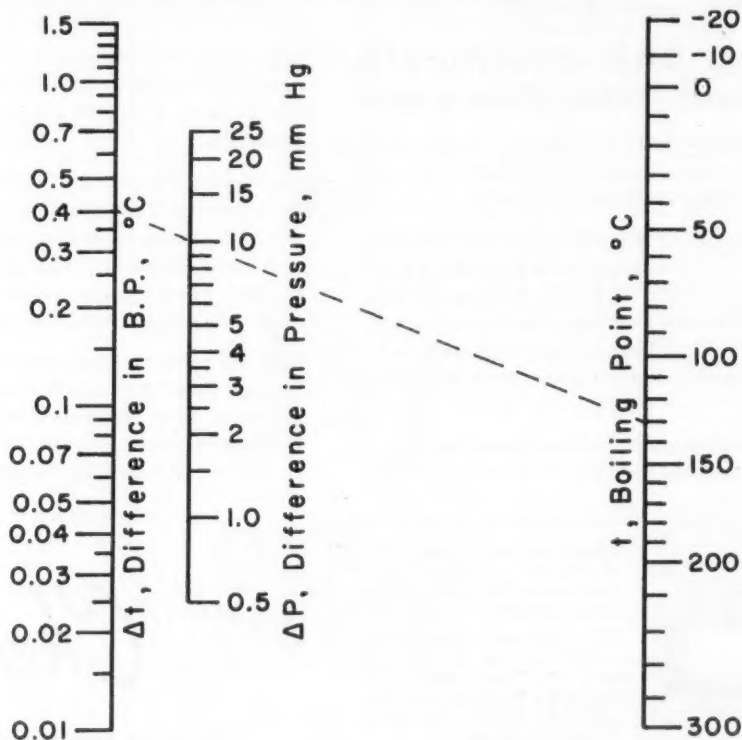
Typical Example

What is normal boiling point of a liquid observed to boil at 130.0°C at 750 mm Hg absolute?

Connect 130 on the t scale with 10 on ΔP scale (difference between 760 and 750). Read 0.4°C on Δt scale. Subtracting 0.4 from 130.0 gives corrected boiling point of 129.6°C.

LITERATURE CITED

- 1) MILLARD, E. B., "Physical Chemistry for Colleges," 6th ed, p 114, McGraw-Hill Book Co., Inc., New York, (1946).
- 2) RHODEN, M., "Simple Way to Draw Nomographs," *Chem Eng*, p 146, Nov 1952.



a
FLUSH BOTTOM VALVE
that
WILL NOT CLOG UP

Designed for Chemical and
Pharmaceutical Industries

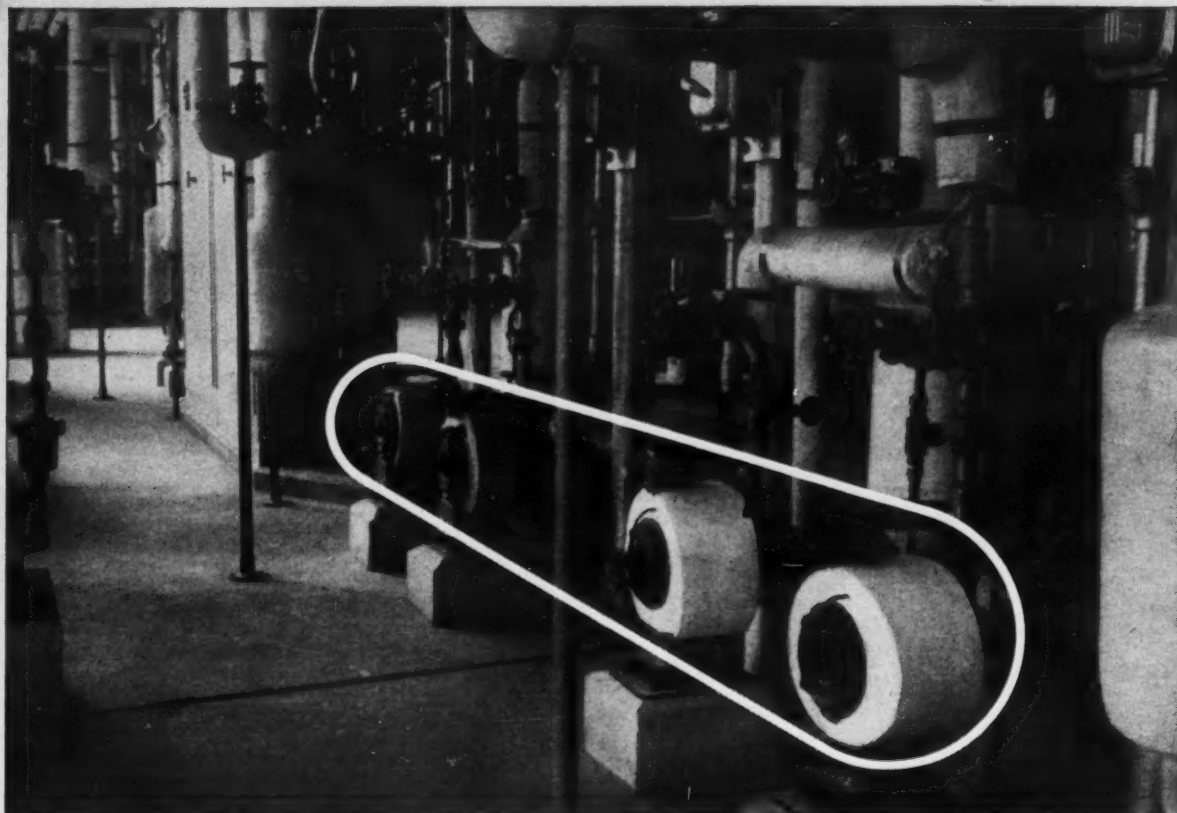
Strahman
RAM TYPE
Drain Valves

The Strahman Drain Valve is the only valve that cannot clog up. It is so designed that in the closed position the piston or ram extends up into the tank thus preventing any possibility of the outlet becoming plugged.

In the open position, full and unobstructed flow is assured as the piston is drawn down into the bonnet leaving a completely open passage for the material passing through.

Write direct for complete catalogue

SV STRAHMAN VALVES, INC.
16 HUDSON STREET
NEW YORK 13, U.S.A.



Chempump guards product purity

handling fine chemicals at Newport Industries plant

Forty-five *Chempumps* help keep product quality high and maintenance costs low at Newport Industries' new Fine Chemicals Plant at Pensacola, Florida.

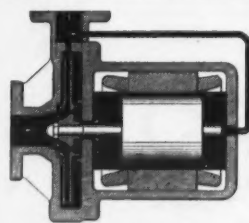
These canned pumps handle synthetic U.S.P. Menthol, N.F. Thymol, U.S.P. Camphor, other high purity pharmaceuticals, and rubber chemicals. Leakage or contamination, which could be mighty costly in this application, are entirely eliminated. *Chempump* can't leak—in or out—because it has no seals, no stuffing box, no packing.

To further ensure absolute purity of products, pumps handling intermediates and final products are stainless

steel. The pumps shown are steam traced and insulated to maintain required temperatures. All stators are protected with Class H high-temperature electrical insulation.

For Newport Industries, *Chempump* means completely closed-system fluid handling. What's more, the simplicity of *Chempump* design reduces maintenance to an occasional inspection and replacement of bearings. External lubrication is never required—bearings are constantly lubricated by the pumped fluid itself.

Why not profit by *Chempump's* many major advantages in your plant? For details, write to Chempump Corporation, 1300 Mermaid Lane, Philadelphia 18, Pa. Engineering representatives in over 30 principal cities in the United States and Canada.



Chempump combines pump and motor in a single leak-proof unit. No shaft sealing device required.

U.L. approved. Available in a wide choice of materials and head-capacity ranges for handling fluids at temperatures to 1000F. and pressures to 5000 psi.

Chempump

First in the field...process proved

NEW SOLUTIONS

From page 54

nism. Lids are opened and closed pneumatically. Low-pressure steam is used for heating. Water is sent through jacket or agitator blade when cooling is required.

Total capacity of each mixer is 200 gal. Vacuum seal stuffing boxes prevent product contamination from lubricants and keep bearings free from abrasives. Agitator drive is connected to 440-v line. Explosion-proof construction is used throughout.

Results: Mixers provide fast, safe, and efficient method of dispersing the various ingredients used in the solid propellant fuel formulation. Temperature control is no problem. Units produce uniform batches without difficulty. Machine's heavy-duty construction provides economical operation with minimum maintenance.

(Heavy-duty dispersion mixers are products of The J. H. Day Company, Division of The Cleveland Automatic Machine Co., Cincinnati 12, O.)

Check 3264 opposite last page.

Inert gas generator operates under high pressure

Unusual feature of inert gas generator in service at the new refinery of Tidewater Oil Company near Wilmington, Delaware, is that it operates under high pressure. In furnishing inert gas for refinery, the generator helps to assure its safe operation.

Both combustion chamber and control equipment are designed to operate at elevated pressures. Fuel for unit, which consists of propane or natural gas, is controlled at a pressure of about 35 psig. Air at same pressure is obtained from the first stage of a three-stage compressor.

Combustion products, after being cooled, are returned to second stage of compressor so that ultimate end pressure of inert gas is about 300 psig. Design of generator eliminates need for air blower on unit itself.

Inert gas generator is used

Check 3263 opposite last page

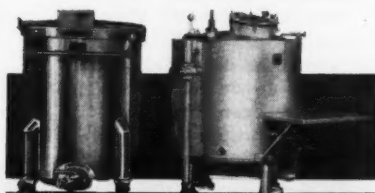
CORROSION-RESISTANT SEAMLESS WELDED and THREADED FITTINGS

by Craftsmen in Stainless Steel

Whatever type of corrosion resistant fitting you need — welded, paper gasket, metal to metal or molded gasket UNIONS . . . A-P-C has it — in stainless steel. And A-P-C will make you special fittings to your specifications. A-P-C's motto is "one piece or a million."

STAINLESS STEEL TANKS

Mixing tanks, refrigerated tanks or storage tanks, pre-mix tanks and tanks for highly specialized uses — in sizes from 1 to 20,000 gallons — all are well within the scope of A-P-C's high craftsmanship.



And Sample Bombs for the Petro-Chemical Industry . . .

Sample bombs are made in a highly unusual range of designs and capacities — from 10 cubic inches to 10 gallons — and special designs are welcomed.

Send for this book of A-P-C facilities

So wide is the amplitude of special equipment and utensils of A-P-C design that you should send for your copy of A-P-C free product and facilities book. Just a post card will do — but mail it today.

CRAFTSMEN IN STAINLESS STEEL SINCE 1929

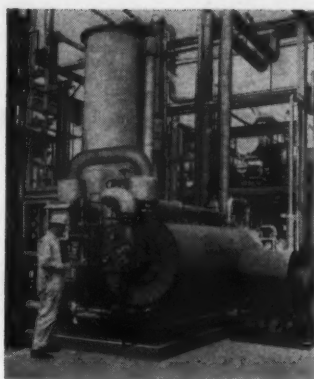
ALLOY PRODUCTS CO.

1075 Perkins Ave. • Waukesha, Wisconsin

Check 3265 opposite last page

JANUARY 1959

NEW SOLUTIONS



Inert gas generator helps to maintain safe operation of new Tidewater refinery

in conjunction with blanket-ing and purging systems on hot oil (450°F), for sulfur tanks, and for catalyst regeneration in reforming operation.

Essentially generator burns oxygen from air, forming a mixture of nitrogen and carbon dioxide. Since carbon dioxide presents corrosion problems in wet system, it is removed from gas by caustic scrubbing. Caustic scrubber is used only when regenerating reformer catalyst. Inert gas requires drying to prevent CO₂ — corrosion on lines and equipment when caustic scrubber is not used. Nitrogen gas produced contains a maximum controlled oxygen content of 0.5%.

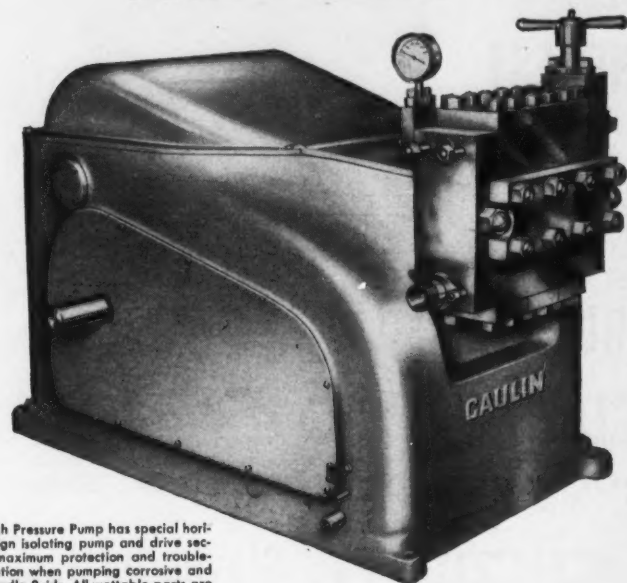
Inert gas generator is designed for maximum safety. Air and fuel are independently metered and controlled. Unit is designed with automatic precombustion purge. It can burn hydrogen safely. Stainless combustion chamber retards formation of undesirable oxides of nitrogen.

(Inert gas generation is product of Gas Atmospheres, Inc., 20011 W. Lake Rd., Cleveland 16, Ohio.)

Check 3265A opposite last pg.

Steel sphere, 190 ft in diameter, designed to house atomic reactor is shown in various stages of construction through medium of 16 mm sound, color motion picture. Film runs 25 minutes. Public Relations Dept., Chicago Bridge & Iron Company, 332 S. Michigan Ave., Chicago 4, Ill.

PUMP AND CONTROL LIQUIDS, ABRASIVE SLURRIES and VISCOUS FLUIDS WITH GAULIN TRIPLEX AND HX PUMPS



Triplex High Pressure Pump has special horizontal design isolating pump and drive sections, for maximum protection and trouble-free operation when pumping corrosive and hard-to-handle fluids. All wettable parts are stainless steel. Capacities to 6000 gph, pressure to 12,000 psi, temperatures from -90°F to +550°F.

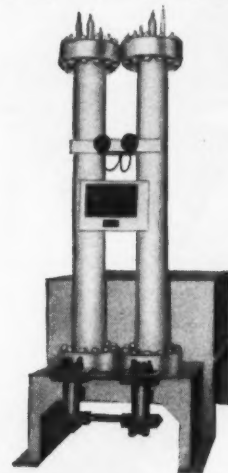
The Gaulin Triplex High Pressure Pump is a rugged, heavy-duty machine for large volume pumping of all types of fluids.

Applications include Spray Drying, Metering, Transfer, Injection, Testing and Hydraulic Pumping. There are over 100 different models available to handle every type of product efficiently and economically. These include sanitary, corrosive, abrasive, viscous and volatile.

The Gaulin HX — Hydraulic Pressure Exchange Pump is a high pressure, high capacity pump specially designed for handling extremely abrasive and corrosive muds, slurries and solutions. It features uniform discharge, slow cycle operation and elimination of all plungers and packing. Handles pressure to 2000 psi, capacities to 120 gpm. Higher capacities on special order. No moving parts are in contact with the product.

Send for GTA Technical Data . . . Complete specifications and technical information contained in GTA† Bulletins. Ask for P-55 on Triplex Pumps and HX-57 on Pressure Exchange Pumps; or request experienced Gaulin Technical Assistance to answer your application.

†Gaulin Technical Assistance.



Write for your set of GTA Bulletins



Manton-Gaulin Manufacturing Co., Inc.
55 Garden Street, Everett 49, Mass.

World's largest manufacturer of stainless steel reciprocating, positive displacement, pressure exchange pumps, dispersers, homogenizers and colloid mills.

Check 3266 opposite last page

THE BIGGEST, NEWEST IDEA IN INDUSTRIAL GLOVES!



PROTECTION **NORTH** • PVC Gloves by Jomac, AT ALL POINTS job-proved for extra safety, extra wear

Check these advantages . . .

- **Extremely tough**—Last two to five times longer than ordinary industrial gloves
- **Very flexible**—Give greater dexterity than any other coated gloves. Made in sizes for maximum comfort
- **Highly resistant**—Nonflammable, nonoxidizing and resistant to practically all chemicals—will not crack or peel

Give your employees the maximum protection afforded by North PVC Gloves. There is a size to fit every hand—fit it comfortably, and in this way lessen fatigue and increase efficiency. You will find production going up, accident rate going down. Available in knit-wrist, band top and gauntlet types—palm and partial back coated styles.

FREE OFFER—On your business letterhead, kindly furnish details of your working conditions—and we will send you a sample pair.

We also make a complete line of North PVC chemical and foul weather protective garments and the famous Jomac loop-pile industrial gloves, handguards and safety sleeves for hand-to-shoulder protection.

JOMAC Inc.

Dept. N, Philadelphia 38, Pa.

Associated companies and distributors throughout the world

Check 3267 opposite last page



1600 SERIES. Fully coated, heavy duty.



1800 SERIES. North-Grip—Permmuff surface; for handling slippery surfaces.

**CHEMICAL
BUSINESS** / Marketing
Trends

RSVP

for Victor Chemical Works

Latest dividend in consumer market research study made for Victor Chemical Works is marketing service that Victor has developed for its customers — the millers. And, indirectly, Victor is creating a more plush market for itself. This approach to marketing may be used more and more by other basic chemical producers.

Believing that an expanded market will immediately result in improved phosphate sales, Victor has been pushing use of self-rising flour to the consumer in 12 southern states. Original angle was that the average southern housewife, living in areas where self-rising products were already used, was a key factor. About two years ago an independent research organization was retained to ask the lady of the house the right questions, in the right way, so Victor could discern its sales potential.

Called "Futures", the market study pointed out that the market potential for self-rising flour is tremendous. And Victor also learned that the kind of promotion needed to exploit this market is through education.

A company spokesman says "let's face it. We learned that we've got to tell housewives something about this product — how to use it, — its convenience, — its versatility, — its economy, — to get the story across."

So . . . Victor made a television film to promote self-rising flour. This was shown all over the South, and in other areas. Results of a recipe offer made in the film stunned Victor. Over 19,000 recipes were distributed as a result of this TV promotion. Victor calculates that the film has been seen by over 2½ million potential customers. And — Victor also found that there is a strong interest in self-rising flour in areas other than the original southern states.

Victor had another idea. Why not reach the nation's home economist. In educating these 65,000 women to advantages of self-rising flour, Victor knew future generations would be reached and — this is important — the

nation's home economists are the primary source of recipes used by housewives all over the country.

Victor sponsored a self-rising flour recipe contest for the home economist. The number of recipes received amazed Victor. They came from 43 states and covered almost all types of baked goods.

Victor believes that by selling the housewife, it has aroused "nation-wide" interest in self-rising flour and is increasing demand. Not that Victor is forgetting the retailer, it isn't. Victor is working through the millers with "package" promotion deals.

What's the result? Victor is stressing that the field is only scratched to date. The millers are said to be extremely enthusiastic even to the point of developing their own prize-winning recipes and thus promoting their own product.

RSVP, according to Victor, should be the theme for the programs. Victor says "recipes stimulate volume profits."





MORE STABLE, UNIFORM EMULSIONS

Carboxy vinyl polymer acts as combined emulsifier stabilizer in low concentrations. This water-soluble product has wide versatility

A fluffy, white, acid powder holds promise of providing more uniform, stable emulsions and even eliminating the "shake well before using" label. Carbopol 934® is a carboxy vinyl polymer of extremely high molecular weight. When dissolved in water and neutralized with a suitable base it produces a highly viscous mucilage.

One of the important results of this thickening is product's ability to stabilize emulsions when used at low concentrations. In fact, a concentration of less than 0.1% is commonly used for emulsion stabilization.

Since polymer has carboxy groups along chain it is possible to impart surface active properties to molecule by neutralizing a portion of these acid groups with long-chain, oil-soluble amines. If remaining groups are then neutral-

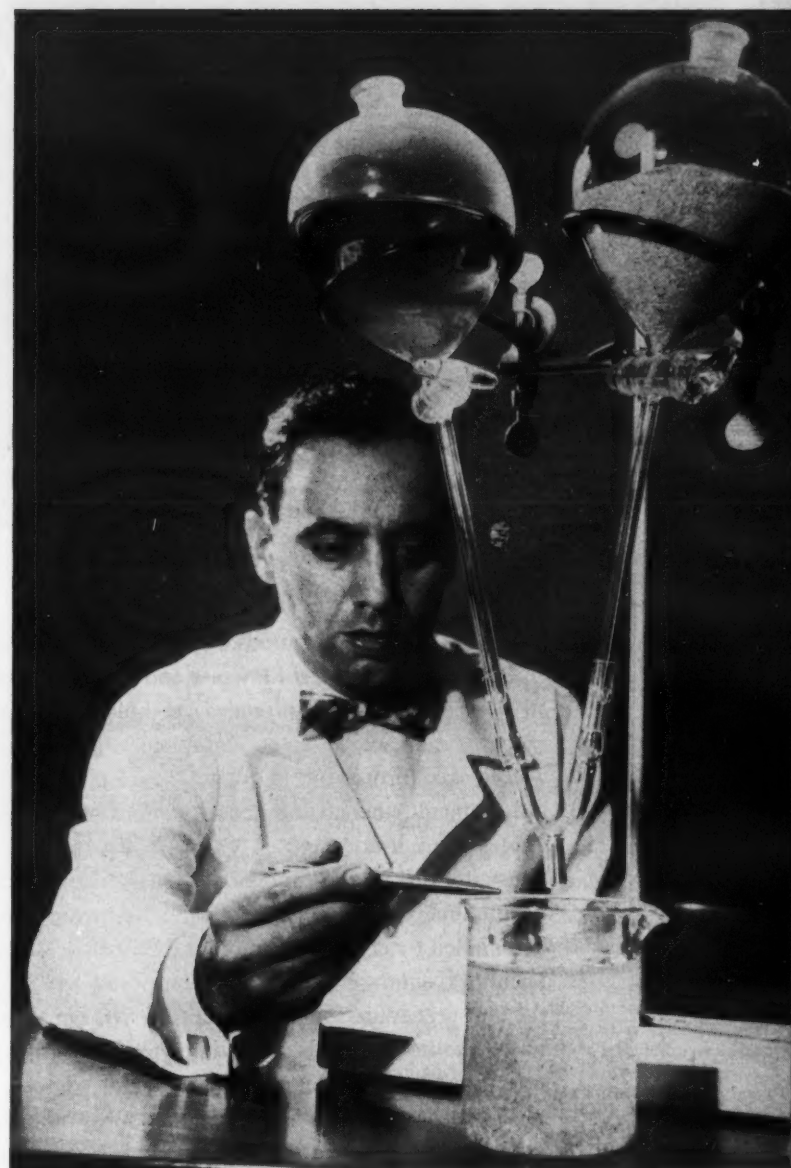
ized with a common base, such as sodium hydroxide, a combined emulsifier and emulsion stabilizer results.

Carboxy groups neutralized with amine are oil soluble while ones neutralized with sodium hydroxide are water soluble. This bridges oil and water phases in an emulsion and also maintains stability by thickening water phase.

Two Big Advantages

Primary advantage of using this product in emulsions is low concentrations of mixed salt required. In most systems the emulsifiers perform little service in final use of product and are present only to make and maintain emulsion until it is used. Therefore, it is usually desirable to keep emulsifier to a minimum.

An example would be auto polish. If a large amount of emulsifier is present there will



Suspended sand here demonstrates how particles remain dispersed and suspended throughout a solution indefinitely after formation of stable emulsion with Carbopol 934

be a tendency to re-emulsify every time water is applied. Also, a large amount of water soluble material causes blanching.

Another advantage of system is wide range of water immiscible materials which can be emulsified without depending on critical oil-soluble/water-soluble balance neces-

sary for many emulsifying systems now used.

Emulsions can be made very thick with low concentrations of polymer. Even thick emulsions are easily spread. Relatively thin emulsions still have good stability toward accelerated aging.

A typical application would be a mineral oil emulsion in

®Registered trademark of The B. F. Goodrich Company.

10 TO 1... a Dicalite Filteraid gets all 3!



Even on "difficult" filtrations, there's a Dicalite Filteraid to give desired Clarity, fast Flowrate and operating Economy—all at once! For Dicalite provides a complete range of filteraid grades...and we do mean 'complete'. 10 standard grades, widely used throughout industry. If your problem is particularly difficult, there are a score or more of special Dicalite grades. And, if nothing else will serve, we can probably custom-tailor one for your individual requirements.

But, ninety-nine times out of a hundred, your filtration can be handled by correct selection and proper dosage of one of Dicalite's standard grades. And once you have established the best procedure for your processing you can depend upon it...Dicalite Filteraids are famous for their unvarying uniformity and quality, lot after lot.

If you have questions on filtration, why not check with your Dicalite service engineer? His counsel does not obligate you in any way, and his goal is the same as yours—to obtain for you required clarity at maximum throughput with minimum filteraid dosage. Call him, or write us—today.

Dependable
GLC
GREAT LAKES **Dicalite**
DIATOMACEOUS MATERIALS

DICALITE DEPARTMENT, Great Lakes Carbon Corporation, 612 So. Flower St., Los Angeles 17, Calif.

Check 3268 opposite last page



Among the DIATOMS
shown here:

SYNEDRA • NAVICULA • CYMBELLA
SURIRELLA • COSCINODISCUS
ACTINOPTYCHUS • EPITHEMIA
EUNOTIA

CHEMICAL MATERIALS

water for pharmaceutical, cosmetic or industrial preparations.

	Parts
Carbopol (1%)	50.00
NaOH (10%)	2.00
Dodecylamine	.34
Mineral oil	50.00

1. Polymer dispersion is prepared with rapid mixing (high shear mixing is fastest).
2. Sodium hydroxide is added (mixture becomes very thick).
3. Dodecylamine is mixed in.
4. Mineral oil is stirred in with rapid mixing. Experience has shown that this order of preparation will give best results. This product has been stable for nine months at 130°F.

Other examples:

Waterless Hand Cleaner

	Parts
Water	50.0
Carbopol	.5
NaOH (10%)	.1
Ethomeen C-25	.5
Mineral oil	33.3
Isopropyl palmitate	16.7

This formulation has a viscosity of 108,000 cps (Brookfield @ 20 rpm) and a pH of 5.9. Emulsion broke in 18 seconds after rubbing on hands and could be easily rinsed off with water if desired.

Drying Oil Emulsion

	Parts
Water	100.0
Carbopol	.2
NaOH (10%)	.6
Ethomeen C-25	.2
Linseed oil*	100.0

This emulsion has a viscosity of 544 cps and is stable to aging. Because of low amount of water-sensitive materials present, emulsion should be of interest to formulators of latex paints.

Tar Emulsion

	Parts
Water	48.90
Carbopol	.25
NaOH (10%)	.75
Ethomeen C-25	.10
Tar TR-12	50.00

*Cykelin, a modified linseed oil supplied by Spencer Kellogg Company.

CHEMICAL PROCESSING

Emulsion is prepared by following procedure given for mineral oil formula. Water phase is heated to near boiling before adding tar at 130°C. Emulsion has a viscosity of 10,000 cps and has proven stable to aging @ 130°F for one month.

Emulsions of this type exhibit uniform drying when deposited in films as compared to a skinning over of tar films deposited from conventional emulsifier systems. Variations of this formulation can be used for roof coatings or, by adding fillers, sealer compounds.



No drying or caking with this hand cream. Water soluble resin acts as both emulsifier and emulsion stabilizer

Carbopol 934 is now being used in pharmaceutical formulations for both internal and external application. It is hoped that additional investigations will make it possible to recommend use in food processing. Industrial use does not involve any toxicological hazards.

Unlike most water-soluble resins, product is supplied in its free-acid form. Since neutralization is required for development of maximum properties, it has versatility that is limited only by number of neutralizing agents that are available.

It can be used to thicken alcohol, glycerine, glycols, and similar materials and even solvents that are not soluble in water.

(Carbopol 934 is a product of B.F. Goodrich Chemical Company, a division of The B.F. Goodrich Company, 3135 Euclid Ave., Cleveland 15, Ohio.)

Check 3269 opposite last page.

BRIEFS

on information about sodium chlorate
for those interested in chlorine dioxide
... a new drum for sulfides ... a grease
that won't burn or corrode ... a booklet
on trichlorethylene

Why you should know more about sodium chlorate

You've undoubtedly been hearing a lot about chlorine dioxide—how it is an unusually effective oxidizing agent—how it imparts no taste or odor to end products.

Not nearly as much has been said about chlorine dioxide's starting point—sodium chlorate. We think this ought to be corrected, since most everyone generates the chlorine dioxide right at the use point.

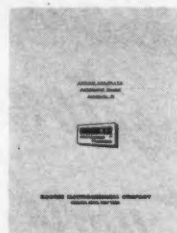
So it is we offer you a bulletin and technical data sheet.

The bulletin tells you all the accepted precautions used in handling and storing sodium chlorate. It tells how to unload a tank car and explains the operation and design of the valves used. It lists physical and chemical properties and illustrates them in a series of graphs and charts.

It also offers methods of analysis.

The technical data sheet tells why more people use more Oldbury® sodium chlorate than any other brand. A typical analysis shows this brand to be 99.8% pure. No water insolubles. No free metals.

You can get both bulletin and data sheet simply by checking the coupon.



Get sulfides in new drum that empties faster, more safely

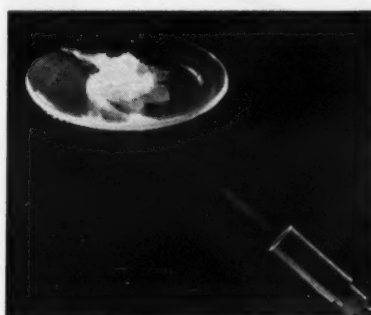
To start with, understand that you pay no extra for this new Hooker drum.

It has an 18-inch opening—four inches wider and 65% larger in area than its predecessor.

The new opening makes it much, much easier to empty either by pouring or with a scoop or shovel. It's safer to use, too. Flakes never pile up around the opening.

We use only brand-new drums; none are re-used. A lacquer lining prevents iron pick-up during shipping and storage. Six lugs hold the lid, keeping it air- and moisture-tight.

For specs on the sodium sulfide and sodium sulphhydrate that go into the drums, check the coupon.



You can't burn this grease ... or break it down

Where could you use a grease that is completely nonflammable; a grease that won't break down in the presence

of oxygen, hydrogen peroxide or concentrated mineral acids and alkalis; a grease that's applicable up to 200°C. (with an oil base stable to 300°C.); a grease that is odorless and non-toxic?

Yes, we are describing one grease. It's named Fluorolube®. It's a high-density polymer of trifluorovinyl chloride. It's available in many grades, ranging from low-viscosity, colorless oils to opaque greases. All are excellent lubricants.

For complete specifications and typical properties, send the coupon for our Fluorolube Data File.



40 pages of facts on trichlorethylene

This handsome booklet on trichlorethylene gives detailed physical and chemical properties, a handy reference to recommended handling and storage procedure, a section on toxicity and safety measures, and an outline of the Hooker services available.

You get something else special when you turn to Nialk® trichlor . . . the chance to choose from five different grades the one best suited to your use.

With the booklet, we'll send you specs on the various grades. Just send us the coupon.

For more information check here and mail with your name, title, company, and address.

- | | |
|---|---|
| <input type="checkbox"/> Sodium Chlorate (data sheet) | <input type="checkbox"/> Sodium Sulfide |
| <input type="checkbox"/> Bul. 99, Sodium Chlorate | <input type="checkbox"/> Fluorolubes |
| <input type="checkbox"/> Sodium Sulphhydrate | <input type="checkbox"/> Trichlorethylene booklet |

When requesting samples, please use business letterhead to help speed delivery.

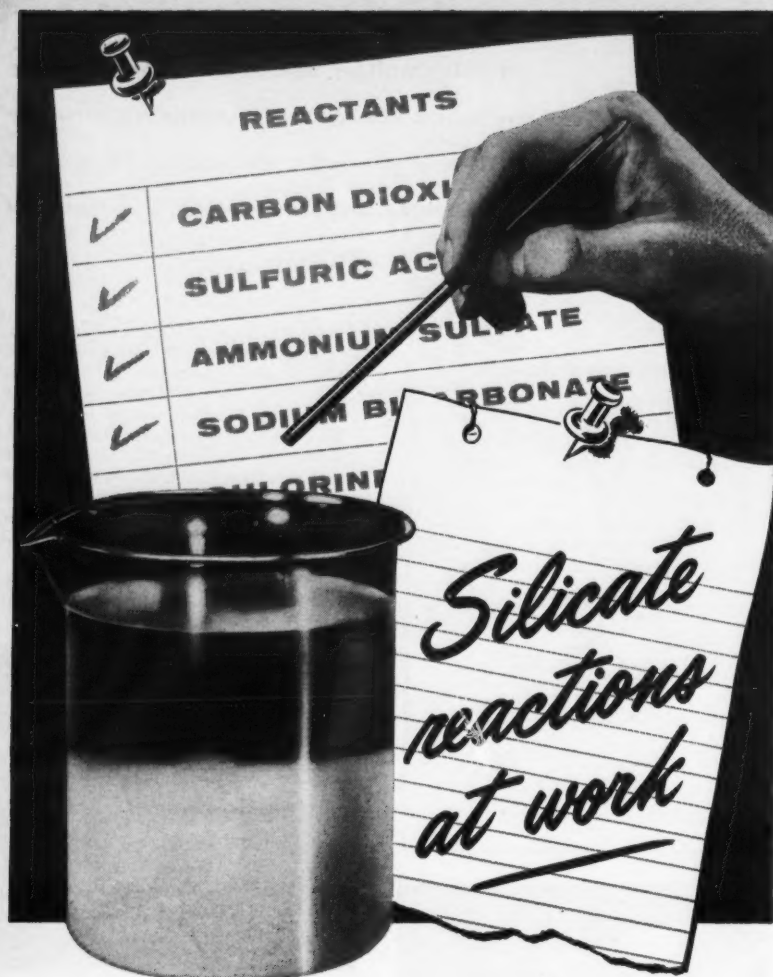
HOOKER CHEMICAL CORPORATION

501 FORTY-SEVENTH STREET, NIAGARA FALLS, N. Y.

Sales Offices: Chicago Detroit Los Angeles New York
Niagara Falls Philadelphia Tacoma Worcester, Mass.
In Canada: Hooker Chemicals Limited, North Vancouver, B.C.



Check 3270 opposite last page



PQ Silicate may be the means of "precipitating" the answer to one of your process problems. Mix a PQ Silicate with acid or acidic compounds and you see a typical reaction—the release of silica. Depending on concentrations and temperature, silica precipitates as a floc, a lumpy mass or a gel.

How does industry put these reactions to work? Here are a few examples...

PQ Silicate precipitated with alum forms a flocculent aluminum silicate. In paper manufacture, this improves the printing surface and adds rattle and snap to the sheet.

Magnesium salts also react with the silicates. In one use, the precipitate is a soft dispersible solid. As a dry fluffy powder it reacts with stomach acids.

Calcium chloride and sodium silicate injected into loose, or unstable sands, gravels or porous earth solidifies these to rock-like masses. Heavy seepage of water is similarly controlled.

Outline your problem to us. We'll be glad to discuss how a silicate reaction may help you.

PHILADELPHIA QUARTZ COMPANY

1060 Public Ledger Building, Philadelphia 6, Pennsylvania

PQ SOLUBLE SILICATES

SODIUM SILICATES • SODIUM METASILICATE • SODIUM SESQUISILICATE • SODIUM ORTHOSILICATE • POTASSIUM SILICATES

Associates: Philadelphia Quartz Co. of California; Berkeley & Los Angeles, California; Tacoma, Washington; National Silicates Limited, Toronto, Canada

Check 3271 opposite last page

CHEMICAL MATERIALS

Concentrates give consistent color to polyethylene

Uses: Standard color concentrates for polyethylene.

Features: Thorough dispersion and consistent colors are obtained. Color uncertainty is eliminated. Changing colors while molding made easier and faster as there is no dusting or shaking loose of pigments.

Description: Standard concentrates comprise high-concentration pigments predisposed in polyethylene resin and pelleted for clean, quick mixing with natural polyethylene base material. Eight concentrates available are white, green, turquoise, blue, light yellow, bright yellow, red and pink. Stocked in 10-pound and 50-pound bags, concentrates are priced at 44 cents per pound for 20,000 pounds or more to 58 cents per pound for less than 50 pounds.

(Tenite color concentrates are products of Eastman Chemical Products, Inc., Kingsport, Tennessee.)

Check 3272 opposite last page.

Fast extrusion feature of two rigid polyvinyl chloride plastics

Little equipment changing needed for processing

Uses: Rigid polyvinyl chloride plastics engineered especially for pipe and contour extrusion applications.

Features: Can be extruded twice as fast as similar conventional compounds. On slightly modified commercial equipment, materials have run as high as 100 percent faster than other rigid polyvinyl chloride compounds and reportedly maintain better surface smoothness.

Description: Compounds are free-flowing. One (QGD-5010), designed for high impact, in extruded form has an Izod impact strength measuring in range of 20 to 30 pounds per inch of notch. It is suggested for pipe where high

Hallco HA-5A

High Molecular Weight Polymeric Plasticizer

for use with
Vinyls
Cellulosics
Synthetic
Rubbers
Polymers

to prepare
Sheeting
Coated Fabrics
O-Rings
Molded Goods
Gaskets
Wire
Tapes
Cable

check these features
• Exceptional Permanence
• Excellent Compatibility
• Resistant to Ultra-Violet light
• Non-extractable
• Non-migratory



THE FLAME AND THE FLASK
Symbol of Quality

Ask for information about other Polymeric Plasticizers available for specific applications.

The C.P. Hall Co.
CHEMICAL MANUFACTURERS

5245 W. 73rd St., Chicago 38, Illinois
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Check 3273 opposite last page
CHEMICAL PROCESSING

CHEMICAL MATERIALS

chemical resistance is required. Other compound (QGD-5020) is characterized by high degree of chemical inertness. It withstands contact with many strong acids, alkalis, metallic and ammonium salts, alcohols, and aliphatic hydrocarbons.

(QGD-5010 and QGD-5020 are developments of Bakelite Company, Division of Union Carbide Corporation, 30 East 42nd St., New York 17, N. Y.)

Check 3274 opposite last page.

Mo and W Intermediates in sufficient supply for industrial use

Show promise for catalysts
and cyclopentadienyls

Three molybdenum and tungsten compounds, now being produced in semi-works quantities, are available for first time in sufficient supply for industrial application. The materials, with a fourth, open up different application possibilities, such as catalysts, a variety of chemical reactions using these intermediates, and vapor phase deposition of molybdenum and tungsten metals.

Products (molybdenum hexacarbonyl and pentachloride; and tungsten hexacarbonyl and hexachloride) can be used as chlorination, polymerization or condensation catalysts, or are suitable as acetylenic or oxo reaction catalysts.

The hexacarbonyls are regarded as parent compounds for the cyclopentadienyls, and are classified as true organo-metallic compounds having a metal-to-carbon bond. The chlorides react with oxygen containing compounds to form a host of oxychlorides useful as catalysts.

(Molybdenum hexacarbonyl, tungsten hexacarbonyl, tungsten hexachloride and molybdenum pentachloride are produced by Climax Molybdenum Company, Div., American Metal Climax Incorporated, 500 Fifth Avenue, New York 36, New York.)

Check 3275 opposite last page.

*Reactive Polymer-forming Intermediate
now amply available at an attractive price*

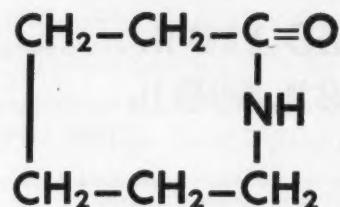
NATIONAL[®] ϵ -CAPROLACTAM

Best known as the monomer of Nylon 6, ϵ -Caprolactam should be increasingly useful as a building block for new organic chemicals. Already very substantial product development research is being based on this unique 6-carbon compound. But its reactivity and polymer-forming possibilities are yet to be fully exploited.

We have recently expanded our production of ϵ -Caprolactam at our Hopewell, Va. plant to more than sixty million pounds per year. We can therefore give you the benefits of assured supply at an attractive price.

WRITE FOR TECHNICAL BULLETIN I-14

To help in exploring new uses, we have prepared a 12-page bulletin giving complete properties, known chemical reactions and uses as well as a comprehensive bibliography. Of course your copy will be sent without obligation.



**NATIONAL ANILINE
DIVISION**

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Atlanta Boston Charlotte Chattanooga Chicago Greensboro
Los Angeles Philadelphia Portland, Ore. Providence San Francisco

Please send me a copy of
TECHNICAL BULLETIN I-14

NAME _____

COMPANY _____

ADDRESS _____

Check 3276 opposite last page



FOAM
on your
back?

knock it down with a Dow Corning SILICONE DEFOAMER!

If foam has you down (and your processing too), try a Dow Corning SILICONE DEFOAMER. Get this costly menace off your back for good.

Here are examples of how these versatile foam killers have killed foam and increased capacity in different production processes.

1 oz
kills foam in:

- 31,250 lb dog shampoo
- 59,110 lb wire drawing solution
- 62,500 lb alcohol-varnish
paper coating solution

FREE SAMPLE! Make your own test. Return coupon below for generous trial sample of a Dow Corning SILICONE DEFOAMER. No obligation, of course.

first in
silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

NAME		3213	My foamer is
TITLE			
COMPANY			
CITY	ZONE	STATE	
			Oil system
			Aqueous system
			Food products
			Other

Check 3277 opposite last page



Applying a tank lining. Spraying fast, room-temperature-curing formulations is now possible. Formulation can be dictated by requirements of application

Limitations of short pot life and high labor costs, that have restricted use of epoxies in coating applications, were lifted at the Cleveland Paint Show when Bakelite introduced...

Sprayable, Fast-cure Epoxies that Broaden Application Horizons

Uses: Spraying epoxy systems for such applications as tank linings, protective coatings, or non-skid surfaces. By combining resin and hardener just before spraying, formulation and curing speed can be dictated by requirements of application rather than by limitations of former handling methods.

Previously, epoxy formulations that cured fast at room temperatures could only be handled in very small quantities and then only manually. Use was restricted in many areas such as non-solvent coatings and reinforced plastics.

Features: Simplicity and flexibility of system reduce labor costs and open the door to a variety of applications not possible or too expensive before. Specially developed spray gun is always ready for use, even after standing overnight.

Description: Spraying system utilizes 100% reactive epoxy formulations, spray gun,

and proportioning machine.

Resins and hardener are fed separately to gun in correct proportions through positive metering system. They meet in the gun's mixing chamber where they are mixed and forced through the orifice under pressure of 300 psi. Since spray is created by pressure of liquids and not by compressed air, overspray and misting are sharply reduced.

When pressure on trigger is released, a plunger forces any remaining mixed resin through orifice, leaving no material to harden and clog gun. Hose and gun mixing chamber are electrically heated.

Since resin portion of formulation, including pigment, is fed separately, and mixed with hardener just before spraying, color developed will depend on correct proportioning of two components. This provides a visual check on proper operation.

Where filling is desired, or a skid-proof surface needed,

CHEMICAL MATERIALS

sand or other grit may be blown in spray stream. Grit is wet and bound by resin during its application to surface.

Typical 100% Reactive Epoxy Coating System

Resin Portion	
Epoxy Resin ERL-2774	100
Linde R-64	0.8
"Cab-O-Sil"	4.0
Red Iron Oxide	25.0
Hardener Portion	
Hardener ZZL-0814	25.0
Glycerol	2.5

This formulation was developed for filling rough surfaces which may contain fissures, potholes or the like. Thixotropic nature of this coating prevents excessive sagging and drainage from cracks and holes.

(For more information on epoxy resins and formulations contact Bakelite Company, Div. of Union Carbide Corp., 30 E. 42nd St., New York 17, New York.)

Check 3278 opposite last page.

(Spray gun and accessory equipment are supplied by A. Gusmer, Inc., Woodbridge, New Jersey.)

Check 3279 opposite last page.

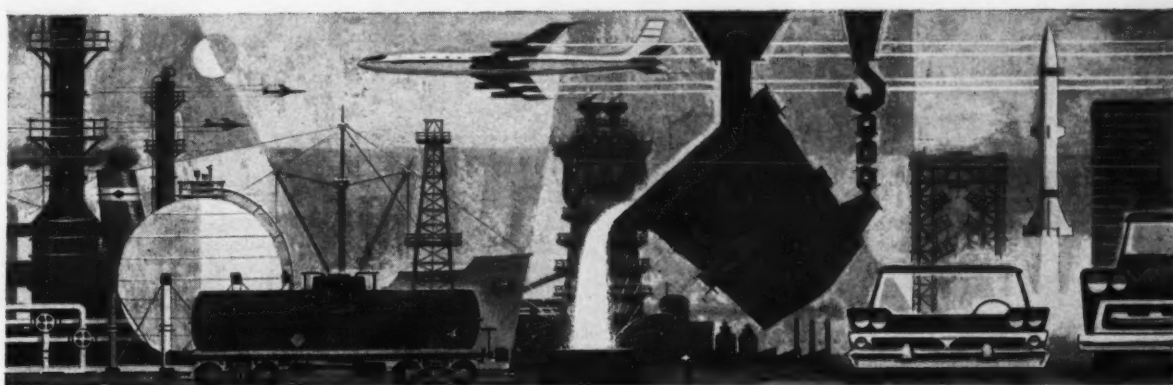


Fast-curing systems, such as this one being used to seal flashing around vent pipe over polymerization vessel, formerly required small-batch, manual handling

The Nation's Top

100

Industrial Corporations All Use Harshaw Chemicals



Harshaw Serves 50 Different Industries!

For each of 50 different industries, including the Nation's top 100 industrial corporations, Harshaw produces a variety of important chemicals. For instance, the Petroleum Industry regularly purchases catalysts, metallic soaps, salts and crystals. The Automobile Industry buys electroplating chemicals and anodes, catalysts, fluorides, pigments and metallic soaps. The

Chemical Industry uses products from six of our ten industrial divisions.

Harshaw produces over 1000 different chemicals for more than 15,000 customers throughout the World. *Probably we have a chemical you can use.* If you have something specific in mind ask us. At your request we'll forward a catalog listing our major products and describing our company.

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Check 3280 opposite last page

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a dependable source for

SODIUM GLUCONATE and GLUCONIC ACID

Promptly available in any quantity.

Warehouse stocks across the country.

Dawe's high quality is assured.

Write for technical data and samples.

Dawe's

**DAWE'S
LABORATORIES, INC.**
4800 South Richmond Street
Chicago 32, Illinois

Check 3281 opposite last page



**MAGLINER
JOB REPORT
No. LR-383:**

**Loading
Costs Cut
80% WITH**

MAGLINER MOBILE LOADING RAMPS

"Before installing our Magliner Mobile Loading Ramp," reports Mr. Leonard Wood, Plant Manager, Witco Chemical Co., "It took 16 to 18 manhours to unload a railcar from ground-level, and four manhours to unload a truck. Three men were required to handle each job. Now, one man and power truck handle a truck shipment in fifteen minutes . . . a railcar shipment in four hours. We figure our Magliner Loading Ramp paid for itself in six months, besides giving us extra safety for men, loads and equipment, and reducing our lift truck maintenance."

ASK ABOUT THE MAGLINER PROOF POSITIVE PLAN—See a Magliner mobile loading ramp at work, cutting costs right in your own operation.

**Now Available! NEW NON-SLIP
GRATING SURFACES FOR SAFE,
SURE TRACTION IN ANY WEATHER**

Another Magliner Exclusive!

Magliner
MAGNESIUM
MOBILE LOADING RAMP

Write for Bulletin DB-211, Magline Inc., P.O. Box 431, Pinconning, Mich.

Check 3282 opposite last page

CHEMICAL MATERIALS

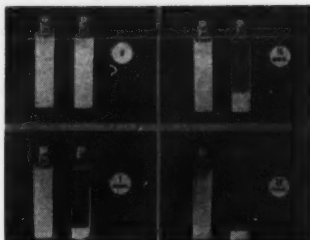
**Water, organics attraction
of extender pigments
is increased**

Surface modifications improve pigments

Uses: Extender pigments for paints, reinforced plastics, inks, adhesives, and rubber.

Features: Surface modifications of pigments result in improved wettability, faster dispersion, increased suspension life, and higher loadings with less viscosity increase.

Description: Surface-modified aluminum silicate pigments (ASP's) are available in grades of three different average particle sizes — 0.55



Sequence on suspension tests of surface-modified ASP (left) vs precipitated CaCO_3 in mineral spirits — at 15 seconds, 1 minute, and 30 minutes

micron, 0.8 micron, and 4.8 microns. Particle shapes are all tin flat plates or stacks of plates. There are seven surface-treated aluminum silicate pigments available.

	AVG. PARTICLE SIZE, MICRON			SURFACE TREATMENT
	0.55	0.8	4.8	
101				0.5% stearate dispersing agent
102	602			
103		403		
105		405		organophilic surfactant

Hydrophilic ASP's

Oil absorption of ASP 101 is slightly higher than for ASP 100 untreated grade. ASP 102 and 602 are treated with a dispersing agent before drying. The result is formation of deflocculated suspensions of high fluidity in aqueous systems. Suspensions



Offer:

- **Versatility:** ideal for batch production or where quick-changeovers are desirable.
- **Simplicity:** most economical to maintain and operate.
- **Corrosion-Resistance:** inert to all chemicals and solvents except hydrofluoric acid and hot caustics.
- **Non-absorbent:** body is dense, impermeable.
- **Non-contaminating:** no metallic impurities, the porcelain body is completely iron-free.
- **Easy-Cleaning:** cleans as easily as a china dish.

All "U.S." vacuum filters will withstand a complete vacuum. They are made in several styles and in a size range from one gallon to 150 gallons.

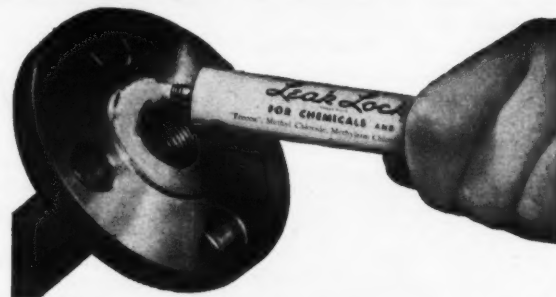
Write for Bulletin F-40

259E

**CHEMICAL
CERAMICS
DIVISION**

U. S. STONWARE
AKRON 9, OHIO

Check 3283 opposite last page



Leak Lock **STOPS LEAKS** where other compounds fail!

Here's a simple, economical solution to many troublesome leaking joint problems. Leak Lock holds LP, gasoline, oils, gases, petro-chemicals and refrigerants that eat through ordinary joint compounds. It's remarkably tough, highly adhesive, remains flexible indefinitely . . . the joint compound that stretches rather than breaks. Years of use have established its advantages in stopping wasteful or hazardous leaks in the petroleum, chemical, atomic energy, electronic, refrigeration and other fields.

Approval by Underwriters' Laboratories for Gas and Oil Equipment List: Also for Propane and Butane.



FREE SAMPLE—Leak Lock is available in handy tubes and in cans. Write on your letterhead for sample tube.

HIGHSIDE CHEMICALS INCORPORATED
16 Colfax Avenue • Clifton, N. J.

Check 3284 opposite last page

CHEMICAL PROCESSING

therefore are longer lasting. Higher loadings of aluminum silicate can be made with less viscosity increase than is obtained with untreated ASP 100 and 600.

Organophilic ASP's

Surface-active treated ASP's — 103, 105, 403, and 405 — have applications in organic systems where their special coatings improve wettability (and dispersion) of the pigments, lower viscosities of highly loaded systems, and improve suspension. When used in water systems they resist emulsification even under severe agitation. Surface actives (polar organic molecules) interact with aluminum silicate surfaces. They are strongly adsorbed and surfaces become more organophilic.

(For more information on aluminum silicate pigments (ASP's) contact Minerals & Chemicals Corporation of America, Menlo Park, N.J.)

Check 3285 opposite last page.

This one-shot catalyst for urethanes makes odorless foams

Supplants costly pre-polymer techniques now used

Uses: Catalyst can be used to foam any commercial polyether to produce flexible, rigid, or semi-rigid foams with a wide range of controlled properties. It can also be used to produce foam from polyether pre-polymers, dimer acid esters, adipic acid esters, and co-polymers of dimers and polyethers, and adipates and polyethers.

Features: Catalyst produces odorless foams. It is expected to supplant costly, tedious pre-polymer techniques now used in most urethane foam manufacture.

Description: Product is triethylenediamine.

(Dabco, one-shot catalyst, is a product of Houdry Process Corp., 1528 Walnut St., Philadelphia 2, Pa.)

Check 3286 opposite last page.

News about

B.F. Goodrich Chemical raw materials



6" pipe made from Geon is used to deliver water from cooling tower on ninth floor of the Cherry Plaza Hotel, Orlando, Florida. Scott-Smith Corporation, Miami, was the installation contractor. B.F. Goodrich Chemical Company supplies the Geon rigid vinyl material only.

Contractor tells how pipe of Geon pays off for air conditioning job

When this hotel added air conditioning, lightweight pipe made from Geon rigid vinyl really paid off. The contractor reports that only two men were needed to install the piping. He also reports that solvent cementing the pipe speeded completion of the entire operation far faster than originally expected.

In addition, the contractor expects future advantages because pipe of Geon is not subject to corrosion. Calcium carbonate won't adhere to Geon—eliminating a major cause of friction drop and

pump overloading. Another advantage: savings in friction loss by use of Geon pipe permitted selection of a size smaller than ordinarily specified on jobs like this.

Conduit or pipe made from Geon offers high tensile and impact strength, too. It's another example of the way Geon polyvinyl material can make possible new or improved products. For information, write Dept. LJ-1, B.F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ont.



B.F. Goodrich Chemical Company
a division of The B.F. Goodrich Company



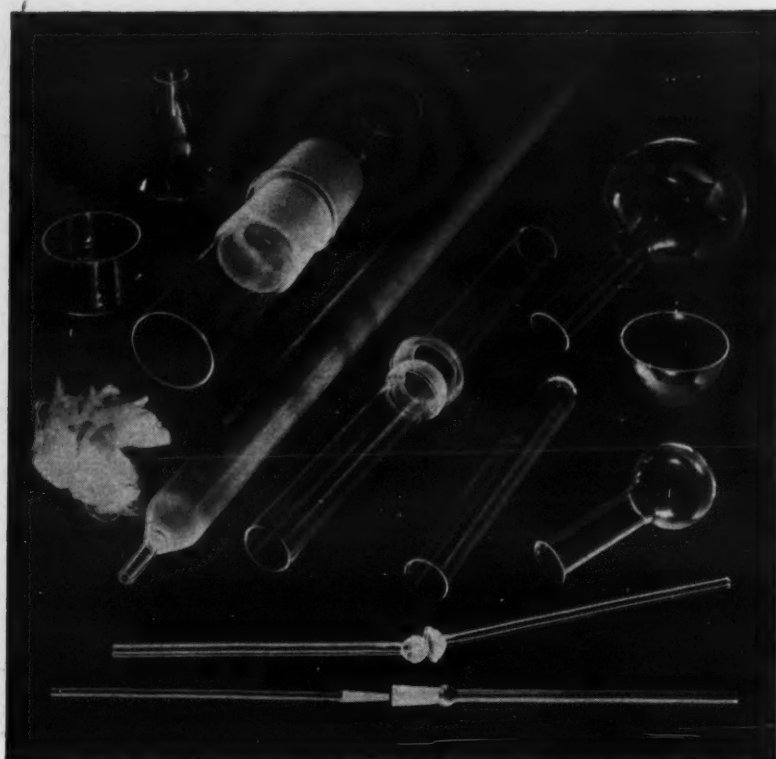
GEON polyvinyl materials • HYCAR American rubber and latex
GOOD-RITE chemicals and plasticizers • HARMON colors

Check 3287 opposite last page

GENERAL ELECTRIC FUSED QUARTZ PRODUCTS

HIGHEST STANDARDS OF PURITY

-AT NO EXTRA COST!



There are four excellent reasons why your primary source of supply for fused quartz products should be General Electric: (1) G-E High Purity Fused Quartz products are completely dependable . . . essentially free of any contamination. (2) General Electric offers a complete line of stock items*. (3) If it can be made from fused quartz, General

Electric can do it—to your specifications of shape and size. (4) You get quick delivery of G-E Fused Quartz products because G.E. now has complete plant facilities devoted exclusively to this end.

CHEMICAL PROPERTIES ARE EXCELLENT

General Electric Fused Quartz is made by the fusion of very inactive natural crystals. It is chemically inert with almost all other materials—except alkaline reagents and one or two acids.

All this is but a small part of the whole exciting new story on High Purity G-E Fused Quartz. The rest is covered in an interesting publication—"G-E Fused Quartz". Write for your free copy today, to: General Electric Co., Lamp Glass Dept. CP-19, Willoughby Quartz Plant, Willoughby, Ohio.

*G-E FUSED QUARTZ STOCK ITEMS READY FOR IMMEDIATE DELIVERY

Standard Taper Joints
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Graded Seals—Quartz to Pyrex
Beakers Crucibles
Flasks Test Tubes
Evaporating Dishes

Progress Is Our Most Important Product

GENERAL  ELECTRIC

Check 3288 opposite last page

CHEMICAL MATERIALS

**Industrial fungicides
lengthen service
life of fabric**

Increased fungus resistance is imparted by three compounds to natural fibers and cordage to give such materials longer service life.

Fungitrol 25, is a solubilized complex of cupferron. Fabrics treated with it have neither unpleasant odor nor serious discoloration. Product's unusual leach resistance makes it suitable for applications such as paper, thread, paper makers felts, etc.

Fungitrol 50, a synergistic zinc mixture, is easily emulsified so that it can be applied from water systems as well as from organic solvents. The resulting treatment in either case is, for all practical purposes, colorless.

Fungitrol 100 is an improved anti-microbial quaternary ammonium compound which reportedly has no color, has low odor, is non-metallic and has great sustaining activities. Good permanence claimed because of high leach resistance.

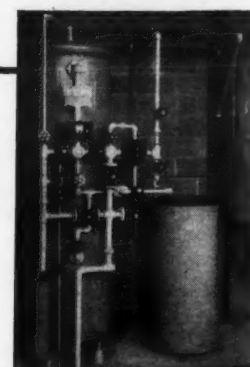
(Fungicides available from Nuodex Products Company, a division of Heyden Newport Chemical Corporation, 342 Madison Ave., New York 17, New York.)

Check 3289 opposite last page.



"Oh my goodness, is potassium para-aminobenzoate a thing? I kept thinking you were just clearing your throat."

**21¢ PER
1000 GALLONS
FOR
Demineralized water
better than
DISTILLED
WATER**



**ELGIN
Single-Tank, Mixed-Bed
DEIONIZER**

What are you paying for distilled or evaporated water? The Elgin Ultra-Deionizer has brought the cost of water, freer from mineral impurities than distilled water, down to the low price quoted above (based on 10 grain water).

It removes all ionizable impurities . . . including CO₂ and silica.

Low investment and operating cost.

Requires less space . . . thanks to exclusive "double-check" design.



**Zeolite Water Softeners
Deionizers
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Water Conditioning Products
for every need.**

Write for
Bulletin 512

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180 N. GROVE AVENUE • ELGIN, ILLINOIS**

Check 3290 opposite last page

CHEMICAL PROCESSING



Developing a new household product?

Give it a
selling fragrance
with ODRENES*

Right now—at the development stage—is the time to plan the odor of your household product.

And you'll save time, trouble and expense if you use an ODRENE. ODRENES are a series of fragrances scientifically compounded to solve the odor problems of household products. They are easy and economical to use—and available in a wide range of consumer-tested odor

types. Each type is extremely versatile—readily adaptable to the special requirements of the product in which it is to be used.

Samples of ODRENES are available on request. And our technical staff—pioneer in the field of aromatics—offers you full cooperation in their use.

*Odrene is the registered trade-mark for Sindar's series of fragrant additives.

SINDAR Corporation

Industrial Aromatics and Chemicals

321 West 44th Street • New York 36, N. Y.

Check 3291 opposite last page

... a machine with
"A GOOD
RECORD as a
REVENUE
PRODUCER"



A typical case of using a Niagara Aero Heat Exchanger to provide cooling for production equipment shows amortization of this machine in 16 months and \$90 per day revenue thereafter.

Industrial engineers with careful cost, upkeep and revenue records on all machines, credit Niagara Aero Heat Exchangers with important gains over other methods.

They use these machines to provide cooling for production equipment, welders, extruders, drawing dies, fur-

naces, quench baths, plating, chemical and electronic process...all millwater system uses.

They get positive control of critical process temperatures with improved product quality, rejection losses prevented. Heat is removed at the rate of in-put.

A closed system, dirt free prevents all troubles from bad water; transferring heat to the atmosphere by the evaporation of a very small amount of water solves all problems of water supply or disposal.

Write for Bulletins 120, 135

NIAGARA BLOWER COMPANY

Dept. CP-1, 405 Lexington Ave., New York 17, N.Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

Check 3292 opposite last page

CHEMICAL MATERIALS

Phthalocyanine blue
has crystal stability
and light fastness

Uses: Very red-shade, crystal-stable phthalocyanine blue now available to compounders and formulators of plastics, rubber and inks previously plagued by color drift.

Features: Product has crystal stability to resist color drift as well as excellent acid and alkali stability, light fastness and durability. Resistance to bleed in solvents reported very good.

Description: Red-shade blue colorant is an all-purpose, full-strength copper phthalocyanine pigment with the following typical properties:

Specific gravity	1.52
Wt./gal, lb	12.7
Bulking value (gal/lb)	0.0787
Oil absorption	19.2
Specific resistance (ohm-cm)	15,000

(Cyan Blue XR-55-3770 is a development of Pigments Div., American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y.)

Check 3293 opposite last page.

Selective hydrogenation
of carbon-to-carbon
double bonds

Uses: Treatment of hard-to-hydrogenate inedible oils such as fish oils or oils with unusual contaminants.

Features: Catalyst permits selective hydrogenation of carbon-to-carbon double bonds of vegetable oils and animal fats. It is reported to have greater first-use selectivity than previously available catalysts and maintains high selectivity and activity.

Description: Nickel-on-kieselguhr catalyst is approximately 25% nickel, 10% support material, and 65% hardened vegetable oil or tallow suspending oil by weight. It will be furnished in granular form with a bulk density of 37 lb/cu ft.

(G-53 catalyst is a product of Girdler Catalysts, Chemetron Corp., PO Box 337, Louisville 1, Kentucky.)

Check 3294 opposite last page.



**INDUSTRIAL
CHEMICALS**

We mine Copper, Sulfur, Iron and Zinc and are basic producers of their chemical derivatives. Our technical know-how and basic position in these minerals is your assurance of exacting quality control, strict uniform consistency and a plentiful supply.

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COPPER SULFATE
MONOHYDRATED COPPER SULFATE
CUPRIC CHLORIDE
COPPER CARBONATE

SULFUR

SULFURIC ACID
LIQUID SULFUR DIOXIDE
SODIUM HYDROSULFITE
PARA TOLUENE SULFONIC ACID,
ANHYDROUS
CHLOROSULFONIC ACID

IRON

FERRIC IRON SULFATE

ZINC

MONOHYDRATED ZINC SULFATE
ZINC OXIDE

MANGANESE

MANGANESE SULFATE
MANGANOUS OXIDE
MONOHYDRATED
MANGANESE SULFATE

Samples, specifications and detailed information upon request.



TENNESSEE CORPORATION

Check 3295 opposite last page

**Fluorocarbon monomer
for special polymers**

Uses: Copolymerization with other monomers.

Features: Product is being studied as a modifier in development of special polymers. It is reported to be only perfluoro organic monomer commercially available.

Description: Perfluorobutene-2 is a gas boiling at 0°C. It undergoes reactions common to fluoro olefins, including halogenation and formation of beta-H-perfluoroalkylethers. Commercial containers are 150-lb and one-ton cylinders.

(Perfluorobutene-2 is a product of Halocarbon Products Corp., 82 Burlews Ct., Hackensack, N.J.)

Check 3297 opposite last page.

**Surface-active agents —
four nonionics added
to company group**

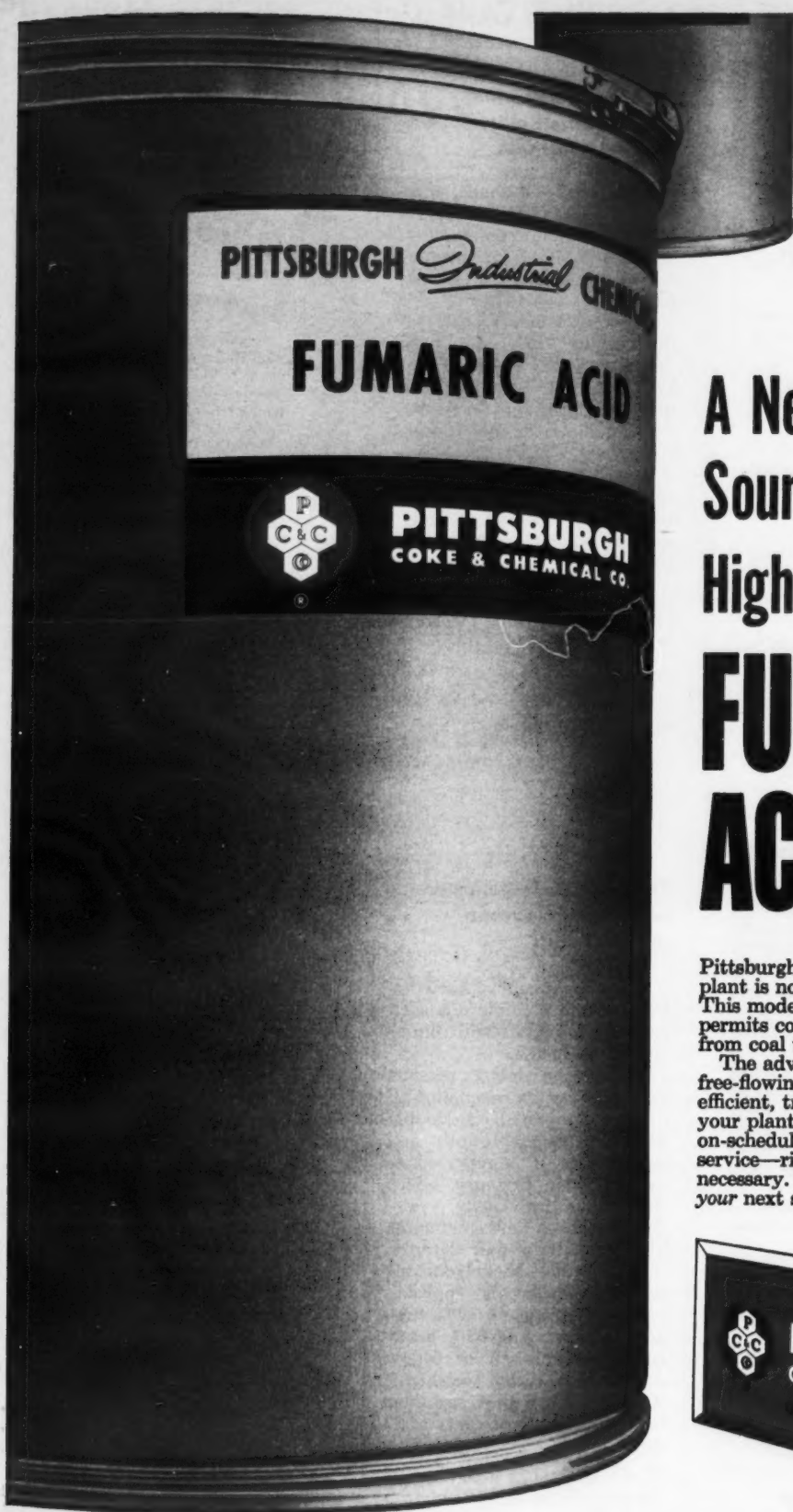
Four nonionic surface-active agents, offered as 85% active solutions, are water soluble liquids with a high degree of chemical stability. Chemically, they are polyoxyethylated products of tri-decyl alcohol.

Poly-Tergent J-200 will dissolve small amounts of water without losing clarity, but goes into a gel state and then into a pasty mixture as more water is added. It has good wetting, rewetting, and emulsifying properties.

The best wetting and rewetting agent in the "J" series, under normal conditions of usage at or near room temperature, is J-200.

The fact that it is more soluble in organic solvents than in water, plus its ability to reduce interfacial tension between oils or solvents in water to an appreciable degree, makes the agent a logical wetting agent in many cases for oil-contaminated surfaces that must be wetted.

Poly-Tergent J-300 is water soluble, but its viscosity increases as water is added, until concentration is below 50%. It is also soluble in etha-



A New Basic Source of High Purity **FUMARIC ACID**

Pittsburgh Coke's new Fumaric Acid plant is now in full production. This modern, integrated facility permits complete production control, from coal to finished acid.

The advantages to you? A high-purity, free-flowing product that helps maintain efficient, trouble-free production in your plant. Plus the assurance of on-schedule deliveries and alert technical service—right in your plant when necessary. Call Pittsburgh Coke for your next shipment of Fumaric Acid!



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COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON • FERROMANGANESE

Check 3296 opposite last page

nol, acetone, and ethylene glycol.

Possessing excellent wetting and detergent properties, J-300 is of use in presence of mineral acids or alkalis or polyvalent metallic salts. It is recommended for use in textile wet-processing applications wherever wetting and good detergency are required.

Poly-Tergent J-400 is soluble in soft or hard water and in 3% acetic acid at temperatures as high as 180°F. It forms clear solutions in ethanol, acetone, and ethylene glycol. Due to its ether structure, J-400 is stable to acids and alkalis in solution. It will not form insoluble salts with polyvalent metallic ions, and it is compatible with anionics, soaps, and cationics.

It is an excellent wetting agent, particularly in acid solutions, and is a fair foamer at room temperature. It is a good detergent for textile fabrics, and a good hard surface cleaner.

Poly-Tergent J-500 is designed for use as a dispersant, low-foaming detergent and associate emulsifier. It has similar solubilities to J-400. It is stable to acids and alkalis in solution, will not form metallic salts, and is compatible with both anionic and cationic surfactants.

It produces relatively high initial foam, but has low foam stability. J-500 is the most hydrophilic member of the series and is efficient at higher temperatures and at higher salt concentrations than other members.

It is a good emulsifier for fatty acids and for natural waxes that have an appreciable free fatty acid content.

(Poly-Tergents J-series are products of The Chemicals Div., Olin Mathieson Chemical Corp., 745 Fifth Ave., New York 22, N.Y.)

Check 3298 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

CELANESE—growing in Monomers

METHYL

ETHYL

BUTYL

ACRYLATES

... produced by the high-purity beta propiolactone process

In its fast developing role as Headquarters for Monomers, Celanese now offers a line of methyl, ethyl, and butyl acrylates—for water base paints, for leather sealants, for textile sizing, for adhesives, for paper coatings—or what have you in mind for them?

Whatever it may be, why not write *now* for samples for evaluation? And call on Celanese technical service for expert product application assistance. Make Celanese your headquarters for monomers.

Celanese Corporation of America, Chemical Division, Dept. 591-A,
180 Madison Avenue, New York 16, New York.

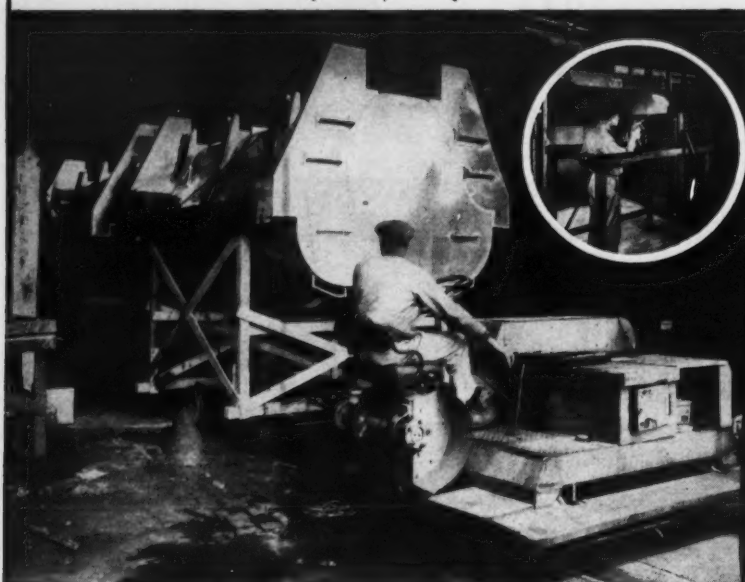
Celanese®



make... **Celanese** your headquarters for Monomers
CHEMICALS

In Canada: Canadian Chemical Co., Limited, 2035 Guy Street, Montreal, P. Q. • Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16.

Check 3299 opposite last page

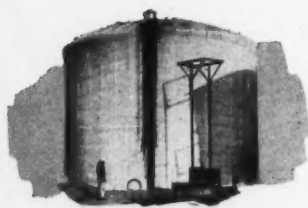


HERE'S HOW **LITHCOTE** PUTS PERMANENT PROTECTION ON DIFFICULT SHAPES AND SIZES...

This is one of several special aluminum trailer tanks—being dollied into a Lithcote oven for a spray coating of NEOPRENE. It's the kind of job that requires the best in application facilities and experience.

NEOPRENE, of course, is only one of the materials Lithcote applies to all shapes and sizes of metals. AMERCOAT, BISONITE, COLUMBIA #7, COPON, PLASITE, UNICHROME, KEL-F, as well as the famous LITHCOTE line of products are also available.

Point is, Lithcote is best qualified to handle any or all of your corrosion and contamination problems, and can do it faster with resultant savings to you!



FIELD APPLICATION

Lithcote Crews are regularly on the job to help cut the high cost of field applications. Work can usually be completed without interfering with regular plant routine.



ASK FOR CATALOG

Far more than a "product" bulletin. Lists actual applications in industry of all kinds. Gives complete data on famous Lithcote line.



LITHCOTE CORPORATION

5000 W. Lake St., Melrose Park, Ill. • 42 Belden Ave., Norwalk, Conn.
36 W. 44th St., New York 36, N. Y.

CHEMICAL MATERIALS

**Color, gloss retention
for baking enamels
with alkyd resin**

Formulations have hardness, flexibility, adhesion

Uses: Formulating baking enamels, particularly for finishes which are subjected to severe wear or must withstand impacts.

Features: Finishes formulated from this alkyd have color and gloss retention at temperatures in 400°F range. They have excellent hardness, flexibility, and adhesion. Combinations with urea-formaldehyde or melamine-formaldehyde resins result in approximately twice baked hardness of conventional saturated oil-modified, alkydamine resin blends.

Description: Alkyd solution, designated Glyptal ZA-114, is comparable in cost to conventional alkyds. It is available in commercial quantities.

(Glyptal ZA-114 alkyd solution is a product of Chemical Materials Dept., General Electric Co., Anaheim, Calif.)

Check 3301 opposite last page.

**For brighter cottons —
a water-dispersible
bleaching agent**

Product is used without solvents or dispersers

Uses: Product is an optical bleaching agent for cotton, linen, wood pulp, and cellulose type fibers.

Features: An ideal fluorescent compound for whitening and brightening cotton and viscose rayon. It can be used in dyebaths without need of chemical solvents or dispersing agents since it is water dispersible.

Description: Agent is a yellow powder designated Cellu-Brite D. With cottons, recommended usage is 0.15 to 0.4% based on weight of fabric; viscose rayons, 0.1 to 0.3%.

(Cellu-Brite D is a product of Carlisle Chemical Works, Inc., Reading 15, Ohio.)

Check 3302 opposite last page.

Highly accurate
**2-MINUTE
CARBON
analysis**

IRON

STEEL

PETROLEUM
CATALYST

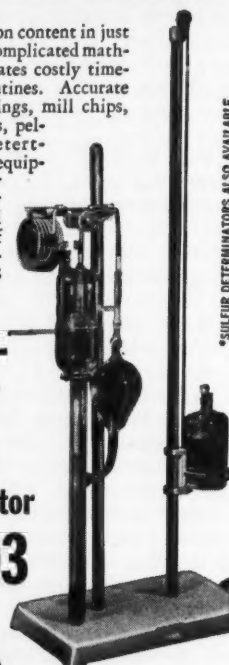
STAINLESS
ALLOYS

FOUNDRY
SANDS

ORGANIC
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Determine carbon content in just 2 minutes! No complicated mathematics; eliminates costly time-consuming routines. Accurate analysis of borings, mill chips, crushed samples, pellets, etc. Dietert-Detroit testing equipment widely used in company laboratories and institutions of every description for over 18 years.

**DIETERT-
DETROIT
CARBON
Determinator
NO. 3003**



for the asking

Free Dietert-Detroit 16 page Catalog illustrates both Carbon and Sulfur Determinators and complete line of accessory equipment.

HARRY W. DIETERT CO.
CONTROL EQUIPMENT

9330 ROSELAWN

DETROIT 4, MICHIGAN

Send me your Carbon-Sulfur Determinator Catalog.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

Check 3303 opposite last page

CHEMICAL PROCESSING

Check 3300 opposite last page

CHEMICAL MATERIALS

Polyurethane vehicle bakes to film that's chemically resistant

Product has excellent dry and physical properties

Uses: As a vehicle in one-coat industrial enamels where outstanding toughness and chemical resistance is needed.

Features: Product air dries or bakes to a hard, chemical-resistant film. It has excellent resistance to water, salt spray, and abrasion.

Description: Polyurethane XP-1210 is an oil-modified, polyurethane vehicle with a 60% solids content. Solvent used is xylol.

(For more information on Polyurethane XP-1210 contact Research Dept., Cargill Inc., 200 Grain Exchange, Minneapolis, Minn.)

Check 3304 opposite last page.

Purify olefin streams by hydrogenating selectively

Catalyst selects acetylenes, leaves olefins

Uses: Catalytic purification of olefin streams by selective hydrogenation.

Features: Product selectively promotes hydrogenation of acetylenes in presence of large excess of hydrogen without promoting hydrogenation of olefins also present. Up to a 50-75% reduction in olefin loss is possible. Concentration of acetylenic compounds may be reduced from several percent to less than 10 ppm.

Description: Catalyst composition is nickel, cobalt, and chromium on alumina-silica carrier. It is supplied in 5/16 and 3/8" spheres with bulk densities of 66 and 70 lb/cu ft respectively. Crush strength, measured as dead weight load, runs from 70-100 lb for 5/16" spheres to 150-200 lb for 3/8" spheres.

(C36 catalyst is a product of Catalysts and Chemical, Inc., 1230 S. 12th St., Louisville, Kentucky.)

Check 3305 opposite last page.

Strong organic base shows promise as epoxy curer

Tri-n-butyl phosphine has reducing properties

Uses: As an epoxy resin curing catalyst; in making vinyl and vinylidene esters; in polymerizing vinyl compounds; and in controlling polymerization of organic isocyanates.

Features: Strong organic base has outstanding reducing properties and ability to form coordination compounds. It can be used as an intermediate for oxide and sulfide derivatives and such addition compounds as phosphine metal or aryl halides, metal cyanides, and metal carbonyls.

Description: Tri-n-butyl phosphine is a clear, colorless liquid of 95% minimum purity, with a characteristic garlic-like odor.

Specific gravity, min (at 25/4°C)	0.8100
Boiling range °C,	
1%, min	198
5%, min	215
97%, max	244
end point, max	249
Freezing pt, °C	-60 to -65
Flash point, °C	40
Fire point, °C	43

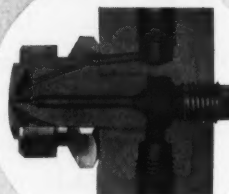
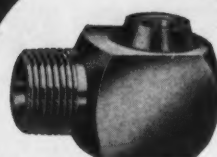
TBP is miscible in all proportions with diethyl ether, methanol, ethanol, and benzene. Solubility in water at 25°C is less than 1% by vol.

(Tri-n-butyl phosphine is a product of Chemical & Plastics Div., Food Machinery and Chemical Corp., 161 E. 42nd St., New York 17, N.Y.)

Check 3306 opposite last page.

Ethylene glycol, mono-, di-, tri-, and tetra-, is subject of 40-page technical bulletin that presents comprehensive review of physical and chemical properties, and industrial uses. Information on methods of shipment, specifications, and analytical techniques required for determining product quality, as well as an extensive, indexed bibliography are also provided. Ethylene glycol Tech Bul — Jefferson Chemical Company, Inc., 1121 Walker Ave., Houston 2, Texas.

Check 3307 opposite last page.



Continuing research is the key to Spraying Systems' product leadership . . . research in new spray nozzle designs and materials to achieve better performance . . . and research in manufacturing methods to give you ever greater product quality at lowest possible cost.

when the problem involves corrosive liquids or gases you have the choice of

STAINLESS STEEL

HARD RUBBER

USCOLITE

LEAD

PLASTIC

SPRAY NOZZLES

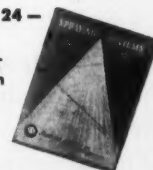
to meet every particular spraying need

Spraying Systems Co. offers a wide range of standard spray nozzles including pneumatic atomizing nozzles for desired performance and chemical stability in spraying corrosive liquids . . . or for spraying in the presence of corrosive gases or vapors. Full cone, hollow cone and flat spray nozzles are available, each in a representative choice of capacities. Experience has shown that within this range of standard spray nozzles you may well find the answer to your particular problem. For the unusual problem, we're always happy to supply the special spray nozzle characteristic or material you specify. Your inquiry is cordially invited.

SPRAYING SYSTEMS CO.

3216 Randolph Street
Bellwood • Illinois

WRITE FOR CATALOG 24 —
a complete 48 page reference catalog for complete technical information on thousands of standard spray nozzle types and capacities.



SPRAYING SYSTEMS CO. THEORETICAL AND APPLIED RESEARCH LABORATORY

Check 3308 opposite last page



✓ LONGER LASTING PROTECTION

... just one of many ways
TYGON
 "ATD" Hot Spray PAINT
 helps you fight corrosion

If cold-applied protective coatings aren't standing up under *your* corrosive conditions, try Tygon* Hot Spray. You'll get a longer-lasting, better-protecting paint film. Adhesion is better. The film is denser, without pinholes. And Tygon Hot Spray offers all the corrosion protection inherent in Tygon Plastics — known wherever corrosives are handled.

Check these important advantages — and then switch to Tygon Hot Spray:

✓ **3 Mil Thickness in a Single Pass.** Two coats provide a five to six mil thick coating. (Equal to five coats of cold-applied vinyl coatings.) You'll save 30% or more in application costs.

Tygon is a registered Trade Mark of The U. S. Stoneware Co.



Write for this TYGON DATA BOOK

Contains complete details on how and where to use Tygon Hot Spray, plus useful information on other Tygon Coatings.

✓ **Minimum Down Time.** Tygon Hot Spray dries almost instantly. Paint tonight — back in service tomorrow. You'll save hours of costly down time.

✓ **Less Overspray.** Means less masking, less material, no paint fog. You'll save material, labor and clean-up time.

✓ **No Thinners Needed.** Heat at 160°F. reduces Tygon Hot Spray to spraying consistency. The small amount of solvent in the paint evaporates almost instantly.

Add to these: Tygon's superior corrosion-resistance, its flexibility and high resistance to mechanical damage, its low applied cost — and you get a convincing picture of the reasons why more and more companies are switching to Tygon Hot Spray Paint.

PLASTICS AND SYNTHETICS DIVISION



U. S. STONEWARE

AKRON 9, OHIO

187F-3

Bead-like granule form of sodium metasilicate eases handling

Compounding made easier by free-flowing form

Uses: Wherever sodium metasilicate pentahydrate is needed as a reaction raw material or formulation ingredient.



Beads, rather than sharp crystals, make product more uniform, free-flowing, dustless

Features: Manufacturing process for compound yields an exceptionally pure product in bead-like form. It is dustless and free-flowing. Improved particle form permits easier compounding and better flow so that compound can be readily mixed with other granular chemicals such as soda ash, phosphates, and wetting agents.

Description: Crystal form, beads rather than sharp crystals, permits sizing material within very close limits. Sodium metasilicate pentahydrate has these physical properties:

molecular wt	212.13
melting pt, °C	72.2
density, g/cc (20°C)	1.749
Specifications	
Na ₂ O%	29.0-30.0
SiO ₂ %	28.0-29.0
Insoluble, % max (in water)	0.10

Material is available in three grades: The 20-40 grade where 90% of material passes through a 20-mesh screen and is retained on a 40; a 10-20 grade which is somewhat coarser; and a finer grade.

(Crystamet sodium metasilicate pentahydrate is a product of Cowles Chemical Co., 7016 Euclid Ave., Cleveland 3, O.)

Check 3310 opposite last page.

Check 3309 opposite last page

With few refineries available to furnish byproduct gases, thriving complex of plants for plastics and other products based on IMPORTED CRUDE and domestic natural gas from the Po Valley shows how —

Italian Petrochemicals Serve as Example to Small Countries



DR. GIULIO BALLABIO, Head, Hydrocarbons & Derivatives Division
Montecatini, Societa Generale, Milan, Italy

Dr. Giulio Ballabio is a real pioneer in Italian petrochemicals. He became Head of the Hydrocarbons and Derivatives Division of Montecatini when it was originally set up in 1950 to start production of petrochemicals in Italy. He has been very active in this field ever since that time. Formerly he was associated with ANIC, which was separated from Montecatini in 1950.

Dr. Ballabio is a chemical engineering graduate of the Polytechnic Institute of Milan. After graduation, he spent three years in the Industrial Chemistry Section of the Polytechnic Institute before he joined Montecatini.

EXPERIENCE OF ITALY — which has built a booming petrochemical business in a few years based on imported crude oil and domestic natural gas — shows that a country need not have plentiful natural resources to enter the petrochemical field successfully.

Birth of the petrochemical development in Italy was in 1950 when construction was started by Montecatini at Ferrara on first plants based on crude shipped from the Middle East to Venice. Olefins are obtained from this crude by thermally cracking distillates, a mixture of naphtha and gas oil, in the presence of steam. These olefins (ethylene, propylene, and butylene) then serve as the raw mate-

rials for polyethylene, polystyrene, plasticizers, solvents, and other petrochemicals. At about the same time Montecatini started using natural gas from the Po Valley as the raw material for the production of ammonia, which is converted into fertilizers and urea.

Investment

About 78 million dollars was invested in petrochemical plants in Italy at the end of 1957. Expansion of present plants and new plants is expected to increase this investment to 190 million dollars by the end of 1960.

Accompanying table indicates that the development of petrochemicals in Italy compares favorably with the oth-

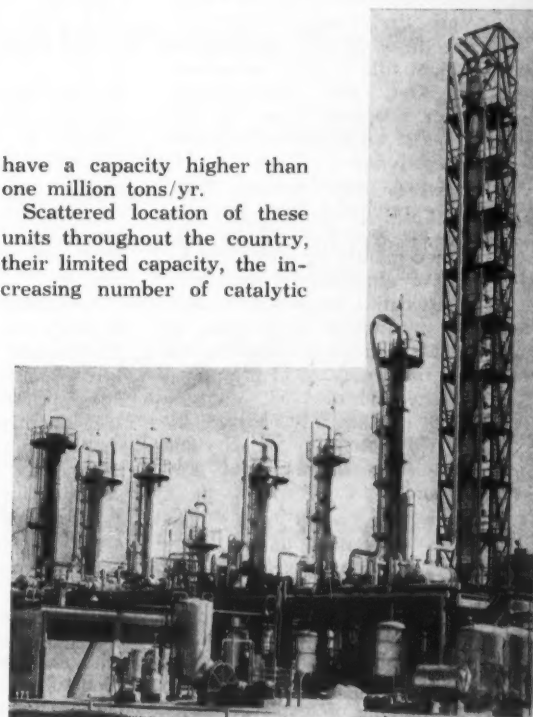
er OEEC countries. This table includes only organic petrochemical products. It does not include the production of ammonia from natural gas, an important part of the petrochemical development in Italy. Let us first consider petrochemicals made from petroleum and then those made from natural gas.

Petroleum

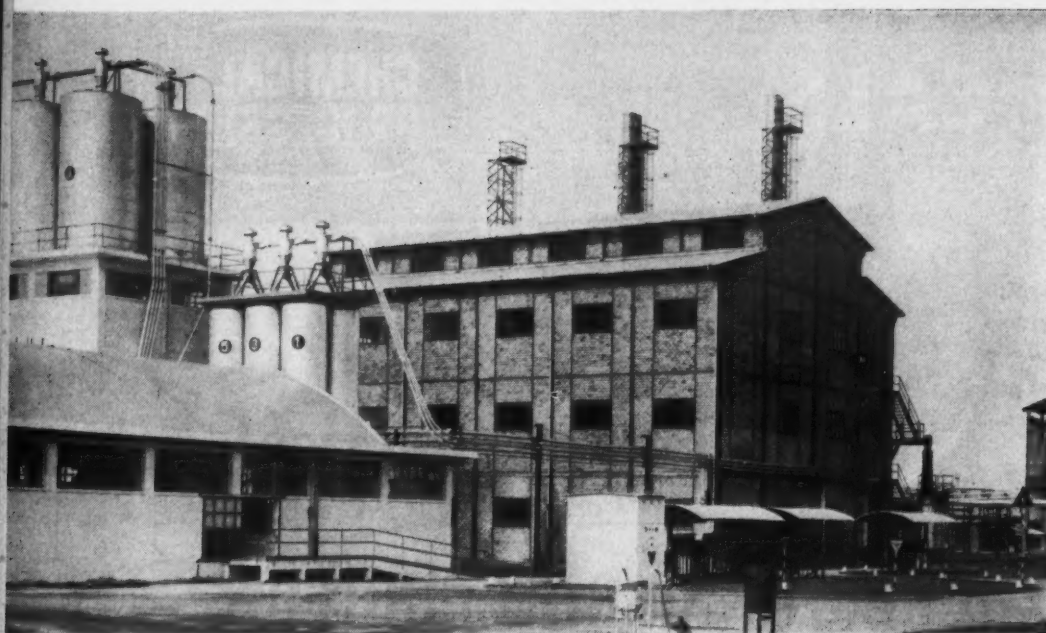
Present installed capacity for the treatment of crude petroleum in Italy is 26 million tons/yr distributed within 36 refineries. Only 12 of these

have a capacity higher than one million tons/yr.

Scattered location of these units throughout the country, their limited capacity, the increasing number of catalytic



Distillation tower of Montecatini's hydrocarbon plant at Ferrara



Montecatini's isotactic polypropylene plant at Ferrara

Italian Petrochemicals — *From preceding page*

reforming units, the still insufficient availability of LPG to meet the increasing needs of the country — these are the principal factors which did not permit, at least up to now, utilization of refinery gases for petrochemical production. Very first case is being realized now by Montecatini which will produce ammonia at first, and subsequently other products, from the tail gases of an important refinery in Sicily.

Hence, petrochemicals presently produced from petroleum are based on olefins obtained mainly by steam cracking of naphtha. In this field, Montecatini increased its olefin production at Ferrara to 40,000 tons/yr of ethylene and the same amount of propylene at the end of 1958. Mantova plant of Edison has a capacity of 10,000 tons/yr of ethylene and about the same of propylene.

Natural Gas

Italian natural gas has an average composition of 98-99% methane, 1-2% ethane, and is practically sulfur free. It lends itself very well to production of petrochemicals,

among the most important of which are ammonia, methanol, and acetylene.

Use of natural gas in the production of ammonia was begun in the Montecatini plant at Novara in 1950 and presently covers about 57% of the total production. By 1959, after completion of several plants now being built, productive capacity from natural gas will rise to 425,000 metric tons/yr of nitrogen fixed as ammonia. In this same Novara plant, a complete integral cycle has been realized with the production of ammonia, methanol, and acetylene from natural gas.

At present, four companies: Montecatini, SIC-Edison, SISAS, and ANIC have a total production capacity of about 60,000 tons/yr of acetylene from natural gas. Production of acetylene and its derivatives still comes mostly from calcium carbide, the production of which is in the range of about 250,000 tons/yr.

ANIC recently started manufacturing synthetic rubber and fertilizers from natural gas at Ravenna. ANIC is planning to increase production of synthetic rubber from 35,000 to 55,000 tons/yr by

means of butadiene obtained by dehydrogenation of C_4 fractions. Production of methanol in Italy (about 45,000 tons/yr) comes completely from natural gas. Other petrochemicals to be made from natural gas soon include chlorinated derivatives of methane, and hydrocyanic acid.

Plastics

Plastics is one of the most important parts of the Italian

petrochemical picture. Production of plastics was 126,000 metric tons in 1957. Montecatini production represented about 60% of this total.

Major expansions are underway in plastics, especially in the polyolefin field. By 1959-60, Montecatini expects to increase high-density polyethylene production by 5000 metric tons/yr, low-density polyethylene by 15,000 tons, polypropylene by 20,000 tons, and polybutylene by 5000 tons.

Other companies will place 10,000 tons/yr of high-density polyethylene on stream and 20,000 tons of low-density polyethylene. These other companies include Celene (Edison and Union Carbide Corp.), which will make low-density polyethylene — Solvay, which will make high-density polyethylene by the Phillips process — and ABCD, which will make low-density polyethylene.

One new and interesting development is Montecatini's present plans for production of polypropylene fibers and new elastomers.

Production of Petrochemicals in OEEC countries: 1954-1957 (1000 tons of carbon contents)

	1954	1955	1956	1957	1958 (a)	% Increase between 1954 and 1957
France	29	37	50	80	142	+ 266
West Germany	70	110	133	166	187	+ 237
Italy	16	26	39	73	130	+ 455
United Kingdom	164	198	218	274	327	+ 167
Netherlands	26	26	31	37	45	+ 145
Total	305	397	471	630	831	+ 206

(a) preliminary estimate

**Compression cost eased
by power recovery
gas turbines**

Uses waste process gases

Substantial reduction of process operating costs is made possible by series of process gas turbine-compressors recently introduced.

The turbine, hailed as an important development in high-temperature power recovery, is designed to expand waste process gases at temperatures up to 1250°F. Turbine-driven compressor delivers air to process at pressures ranging from 30 to 200 psig.

For higher pressure ratios with power recovery, compressors are directly coupled to gas turbine-compressor, with compressors arranged in series. One combination is capable of pressure ratios up to 9.0. Another can handle pressure ratios up to 12.0. Either combination is typical of nitric acid plant applications, with gas turbine being designed to handle total waste gas from process.

(Types PM and HM compressors are developments of the Elliott Company, Div. of Carrier Corporation, Jeannette, Pennsylvania.)

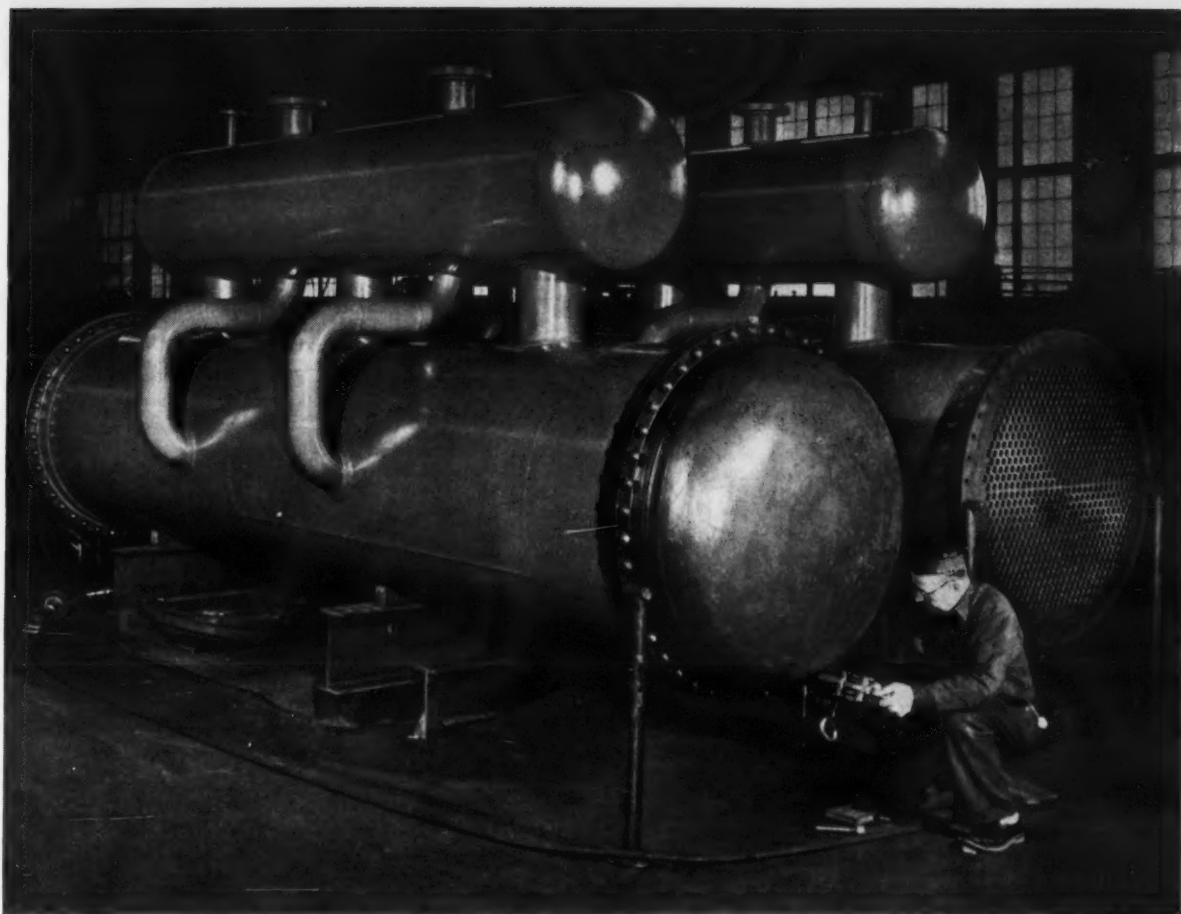
Check 3311 opposite last page.

Higher oxo alcohols

Hardcover book of 120 pages, written by Dr. Lewis F. Hatch, Technical Consultant, Enjay Laboratories, contains an initial chapter on the oxo process. This is followed by chapter on aldehydes and alcohols produced from olefins, carbon monoxide, and hydrogen. Applications of these petrochemicals and their derivatives in plasticizers, agriculture, detergents, and lubricants are covered in succeeding chapters. References to 409 literature sources are given.

("Higher Oxo Alcohols" is available from Enjay Company, Inc., 15 West 51st St., New York 19, N.Y.)

Check 3312 opposite last page.



Single source supply—B&W tubes, fittings and flanges expedite production of this ethylene glycol chiller.

**One Call Will Do It All...
Specify Tubular Products From B&W**

In one recent installation, the tubes, welding fittings and flanges of two ethylene glycol chillers were all supplied by B&W. The reason for this one-source buying? The fact that designers, engineers and purchasing agents alike know that B&W Tubular Products will do the best job possible... efficiently, dependably and economically. One-source buying insures integrated delivery and expedited production in your shop.

And besides the advantages inherent in a centralized source of supply, B&W offers another outstanding value in its Tubular Products. Tubes are tailored to specific jobs. The result—when you specify B&W, you get what you order.

One simple call to B&W can bring you these benefits. As part of the same call and the same service,

delivery can be coordinated on matched pipe, fittings and flanges to meet your specific requirements. Contact Mr. Tubes at your nearest B&W Tubular Products Division District Sales Office. He can help you get the integrated system that you desire. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.



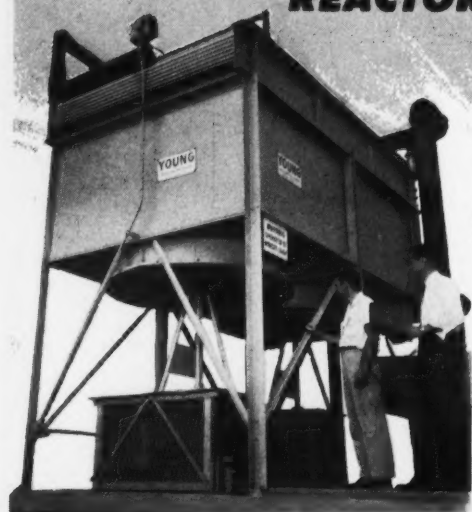
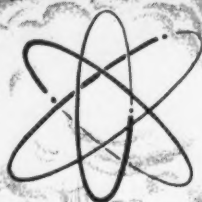
TA-7064-PG5

Seamless and welded tubular products, seamless welding fittings and forged steel flanges—in carbon, alloy, and stainless steels

Check 3313 opposite last page

Young helps tame the ATOM...

HC UNIT BY YOUNG COOLS NUCLEAR TEST REACTOR



This Stainless Steel Horizontal Atmospheric Cooler by Young at Knolls Atomic Power Laboratory is specially engineered and fabricated for cooling water used in the nuclear proof test reactor.

YOUNG engineers specially designed this atmospheric cooler to comply with the rigid specifications set by the A.E.C. The first nuclear test reactor duplicating temperature and pressure conditions of a full scale pressurized water power reactor has been placed in operation by General Electric at Knolls Atomic Power Laboratory (KAPL). A stainless steel horizontal atmospheric cooler by Young cools reactor water which reaches temperatures of 550F. and pressures up to 1250 psi.

The unusual is routine for Young's team of Heat Transfer experts. Their Design, Engineering and Fabrication ability are part of *your* staff when you call upon Young. Write today for assistance with your current or anticipated Heat Transfer requirements. No obligation, of course.

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Write Dept. 379-A
for Catalog No. 557

Check 3314 opposite last page

PETROCHEMICALS

Electronic thermometer, developed by West German company, based on thermistors and designed specifically for industrial use, is described in two-page bulletin. Features are rapid response, fully interchangeable probes, compact design, and scale lengths of up to 420° in three overlapping steps. Portable instrument is 7 x 5 x 2 1/4", is carried on a strap around neck, and is operated by standard batteries. "Thermophil" — Atkins Technical Inc., 709 Marion Bldg., Cleveland 15, Ohio.

Check 3315 opposite last page.

Mechanical seal, which has achieved outstanding results when used on pumps under severe operating conditions, is described in eight-page bulletin. Seal combines the outstanding properties of Teflon with the dependable features of bellows design. Bul AD-164 — The Garlock Packing Company, Palmyra, N. Y.

Check 3316 opposite last page.

Thermocouple assemblies and pressure sealing glands are detailed and illustrated in 36-page catalog which introduces several new additions to company's products. Cat 1885 — Conax Corporation, 2300 Walden Ave., Buffalo 25, N. Y.

Check 3317 opposite last page.

New sulfur recovery unit to serve dual purpose

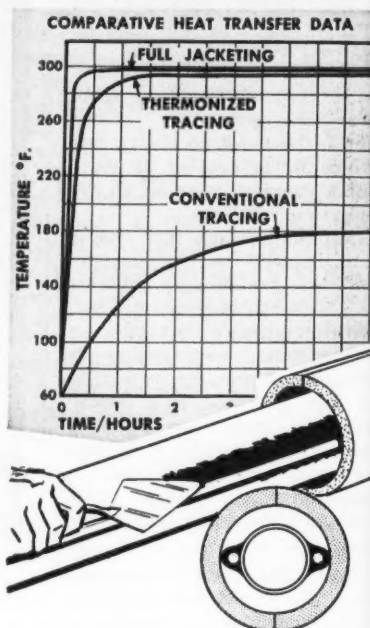
There will be two chief advantages to the new 150-ton a day plant for recovering sulfur from hydrogen sulfide to be built by The Anlin Company of Illinois adjacent to Shell Oil's Wood River, Illinois refinery. One advantage is the recovery of a basic and important raw material. The other is purification of plant byproducts which will eliminate smoke and fumes.

Slated for completion by the middle of 1959, the plant will cost approximately two million dollars. It will be located on a 12-acre site, and will be owned and operated by The Anlin Company of Illinois, subsidiary of The Anlin Company. Shell will supply the plant with its basic feed stock in the form of hydrogen sulfide, from which Anlin will extract elemental sulfur by the amine absorption method.

HAVE YOU TRIED



Thoroughly proved
HEAT TRANSFER MEDIUM
now effecting savings up to
90% for over 700 users!



Thermon is a non-metallic plastic compound with highly efficient heat transfer properties, and is easily applied over either steam traced or electrical resistance systems... working equally well for either heating or cooling processes.

Thermonizing has excellent heat transfer characteristics (see curves), exceeding steam traced equipment approximately 1100%, and closely approaching jacketing equipment. Thermon can be used almost without exception in place of expensive jacketing (and in many applications where jacketing is impossible), with savings up to 90%.

Write for complete technical literature on revolutionary Thermon!



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CHEMICAL PROCESSING

ACCURATE and
DEPENDABLE

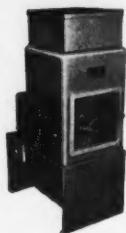


Chemical Feeders

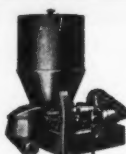
FOR PROCESSING...
TREATING...
MATERIALS
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DRY-COMPACTED DRY-FREE FLOWING

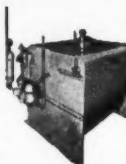
INFILCO type E feeder is specially designed for chemical and food processing. Responds to 1% linear adjustment. Holds feed rate accurately over long periods without supervision. Requires minimum maintenance. Feed rates range from .04 to 8000 lbs./hr.



INFILCO type D feeder utilizes an adjustable knife to "cut" compacted dry chemicals and other solids from revolving table. Feed rates range from .16 to 1840 lbs./hr.



INFILCO Mixer and Feeder delivers uniform solution or suspension. Vertical mixing maintains uniform slurry. Accuracy of chemical content held to 1.5%. Holding capacities from 40 to 3,000 gals. with feed rate range up to 6 gpm.



Pneumatically actuated NEUSOL® feeder handles one or two different solutions at individually controlled rates. Duplex feeder ranges .03 gph minimum (using one pump) to 20 gph maximum (using both pumps). No metal parts exposed to solutions.



PROPORTIONING CONTROLS regulated by time, pH or flow are available for all INFILCO feeders.



INFILCO
INCORPORATED TUCSON
Dept. I. S. P.O. Box 5033 ARIZONA

Check 3319 opposite last page

PETROCHEMICALS

Up to 3000 gpm
handled by
acid pump

Centrifugal acid pump, with 8" discharge, has a capacity up to 3000 gpm. Pump is designed to stand a variety of highly corrosive materials. Other pumps are available with



discharge sizes down to 1" giving a range in capacity from 10 to 3000 gpm and heads up to 200'. Pumps provide continuous, trouble-free performance under severe operating conditions.

(Model AF acid pump is product of A. R. Wilfley and Sons, Inc., Denham Bldg., Denver, Colo.)

Check 3320 opposite last page.

Fabric seal for floating roof tanks which protects the material stored is described in four-page publication. Nylon and Buna N construction of seal provides long life. Fabric conforms closely to shell surface, reducing evaporation losses to a minimum. Bul B-43 — Chicago Bridge & Iron Company, 332 S. Michigan Ave., Chicago 4, Illinois.

Check 3321 opposite last page.

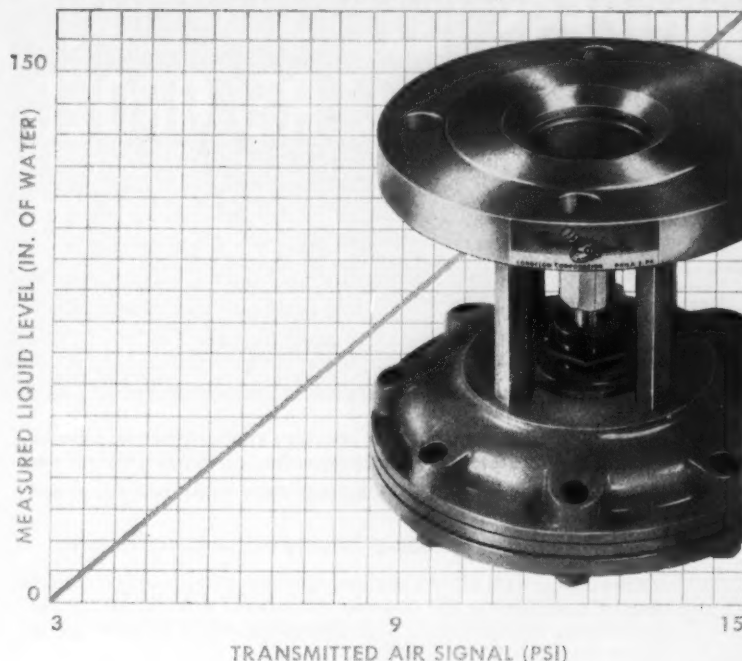
Slide rule calculator which comes in pocket size is designed for use in determining capacity and size of storage tanks. It furnishes information on tanks up to 100 ft high and 300 ft in diameter. Capacities are given in gallons, barrels, and pounds of water. Calculator can be obtained from Hammond Iron Works, Warren, Pa., or 744 Broad St., Newark, N. J.

Check 3322 opposite last page.

Automation answers are provided in 24-page illustrated brochure which contains detailed specifications and descriptive data. Also included are operational charts and a selector guide for photo-electric systems for industrial control applications. Bul PA 561 — Photoswitch Div., Electronics Corporation of America, One Memorial Dr., Cambridge, Mass.

Check 3323 opposite last page.

TYPICAL PERFORMANCE CURVE OF MODEL "P" TRANSMITTER



NEW CONOFLOW LIQUID LEVEL & PRESSURE TRANSMITTER

WITH
Exclusive
ISOLATED
MEASURING
DIAPHRAGM

The Conoflow Model "P" Transmitter is a rugged instrument which measures pressure and liquid level and transmits a linear 3-15 psi signal to standard receiver elements. Incorporates these cost-saving features:

Safety—Process liquids and gases cannot back up through air lines and damage costly instruments. This is guaranteed by the complete separation of measuring diaphragm from pneumatic pilot.

Simple Installation—The Model "P" can be mounted either horizontally or vertically on open or closed vessels. No dip tubes, floats or other mechanical devices are required inside the tank.

Long Life—Only the corrosion-resistant Inconel X diaphragm is exposed to the measured material. Preformed diaphragm will not work-harden or fatigue; withstands pressures to 500 psi and temperatures to 450°.

Versatile—Can be used for practically any service; ideal for viscous fluids or materials with solids in suspension; also for flowing bulk materials such as pigments, flakes, etc.

Choice of Ranges—Available for measuring ranges as low as 0 to 100" of water and pressures as high as 250 psi. Ranges can be changed in the field.

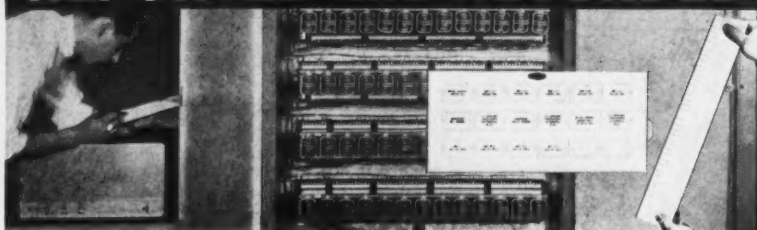
Specifications—Bulletin P-2520-3 contains complete specifications on the Conoflow Model "P" Transmitter. Write for your copy today or let us quote on your requirements. No obligation. Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa.

CC-802



Check 3324 opposite last page

PROCESS INTERRUPTIONS REPORTED and RECORDED



New PANALARM Recording Annunciator Uncovers Profit Leaks

- Pinpoints temperature, flow, pressure and level process trouble areas by accurately, instantly recording off-normal operations.
- Permanent, unalterable statistical data helps prevent downtime repetition.
- No time-wasting decoding. Directly readable digital form.

Model RA helps attain highest quality products by continuously monitoring all process variables. Also helps reduce downtime, maintenance and operating costs in your plant. Write for Bulletin 102 today.



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STATIC



CUSTOM ENGINEERED

RECTIFICATION

Nothing to wear or get out of order in Sel-Rex Semiconductor Rectifier Equipment. Our rectifier equipment may be static in operation, but our engineering research and development is anything but! Sel-Rex is responsible for many rectification-engineering "firsts"—now taken for granted. Ask us about them and our current "firsts."

Send for FREE "GUIDE" to Industrial Rectifier Equipment.

- Germanium
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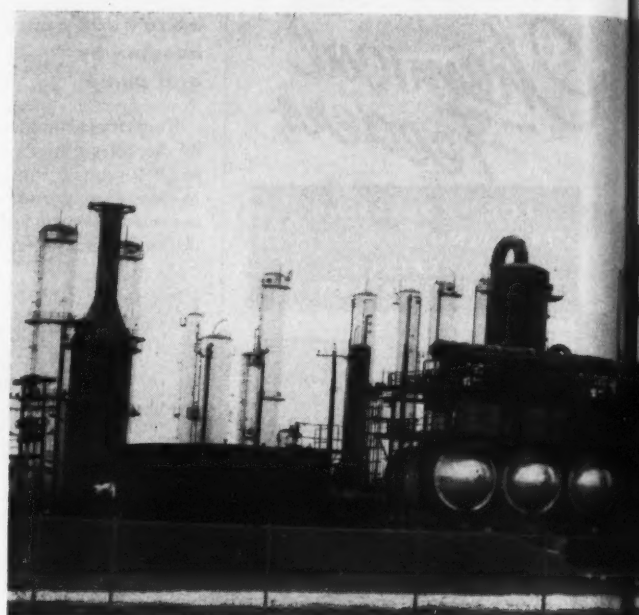
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Representatives in Principal Cities

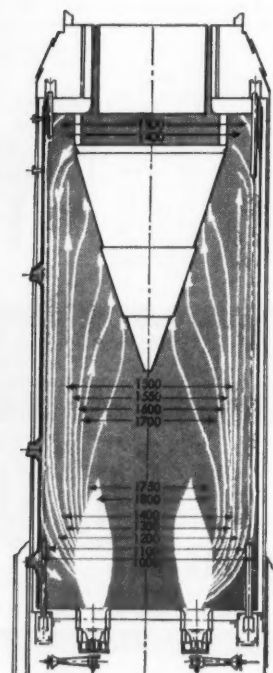
"Complete Semiconductor Power Conversion Systems for any AC to DC application"

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PETROCHEMICALS



More duty— obtained with



Cone is major factor in providing even heat distribution in furnace, which is indicated by temperatures of ascending and descending gases (°F). These were obtained from manufacturer's tests

CHEMICAL PROCESSING



Photos By CP Staff

Three vertical furnaces in use at Texas Butadiene

— dollar per dollar th petrochemical furnaces

Three units have given good, economical service

GORDON WEYERMULLER, Petrochemical Editor

with FRANK McCLAIN, Section Head, Maintenance Engineering
Texas Butadiene & Chemical Corporation

Three vertical furnaces used at Texas Butadiene plant near Houston have been in practically continuous operation since installed in early 1957. Principal reason for the good performance of the units is the design that provides even distribution of heat. Other design features and selection of proper materials of construction are also important factors. Major reason this type of furnace was selected is because of its high heat output. Vertical design was chosen because it is lower in price.

Two of the vertical heaters

are used to raise the temperature of the butane-butylene gas to 1150°F before it enters Houdry dehydrogenation units to be converted to butadiene. One furnace is used for each production line of seven reactors.

Before feed enters furnaces, it passes through heat exchangers, where quench oil vaporizes it and raises its temperature from ambient to around 190°F. Each heater handles 104,000 lb/hr of this vapor. Rating of heater is 77.3 million Btu/hr. Gas coming in


To next page

IN YOUR
PLANT...

STOP THESE 10 LOSSES WITH NEPTUNE *Liquid* METERS

1 
STOP SPOILED BATCHES
Get automatic formula control with Auto-Stop meters.


2
STOP WAITING for liquids to creep up to gauge mark. Let the meter do it!

3 
STOP MANPOWER LOSS hauling buckets or bags. Meters do the measuring while pumps do the work.

4
STOP GIVING AWAY INGREDIENTS by over-measurement just to be sure.

5 
STOP BACK CHARGES for rejects. Meters save customers.

6
STOP GUESSING COSTS. With meters you always know.

7 
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8
STOP RECEIPT LOSSES. Meters prove any shortages.

9 
STOP SHIPPING LOSSES
Meter - printed tickets give proof of honest delivery from your plant.

10
STOP CONTAMINATION of liquids...use Neptune Stainless meters.

METERING DOESN'T COST...IT PAYS BY MAKING THESE 10 SAVINGS REGULARLY IN YOUR PLANT.

NEPTUNE DOES ALL THESE THINGS FOR YOU:



- Cuts off flow at preset quantity
- "Memorizes" formulas of repeated batches
- Prints batch tickets showing amount delivered
- Controls pumps electrically
- Measures over 150 liquids...water, oils, syrups, brines, soaps, chemicals, etc.



GET THE FACTS

Ask for helpful
Meter Data
Bulletin 566 X P.
See Neptune Data
Pages in Chemical
Engineering Catalog.

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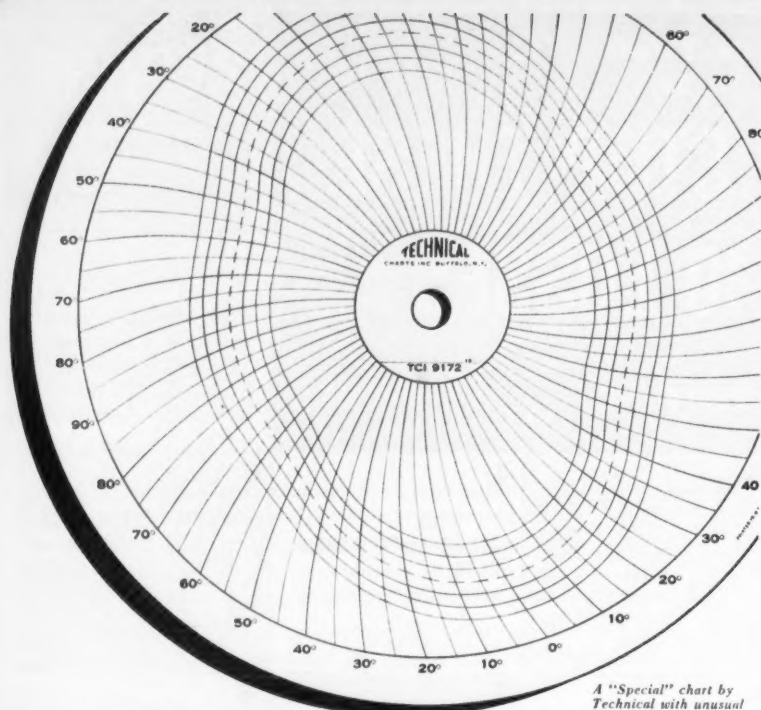
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Check 3327 opposite last page



No standard chart would do the job... so **TECHNICAL** produced these "SPECIALS"!

A "Special" chart by Technical with unusual scale for quality control of critical machining operations.

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The choice of the recording paper on which your charts are printed can help to solve a wide range of recording problems. Technical has special papers for direct production of recordings, papers with dimensional stability, others that are heat or electro sensitive... and more.

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Buffalo, N. Y.

Check 3328 opposite last page

PETROCHEMICALS

at 190°F goes through convection section to be raised to 350°F, then through radiant section to be increased to 1150°F. Outlet pressure is 10 psi abs.

Only the outlet tubes in furnace are alloy, remainder being carbon steel. Furnace has 12 vertical tube banks or passes, each of which contains 9 tubes. First four tubes in each pass are carbon steel, next two being an alloy containing 2.25% chromium and 1.0% molybdenum, and last three being 304 stainless.

Stripper Reboiler

Third furnace in use at Texas Butadiene serves as a stripper reboiler. After effluent gases (butadiene, butylene, and butane) leave Houdry reactors, they are compressed and absorbed. This furnace serves as reboiler for stripper in absorption plant. Charge to it is rich absorption oil.

About 25% of charge is vaporized in furnace to put heat into stripper column. Outlet gases return to stripper at a temperature of 550°F and pressure of 100 psig. Rating of furnace is 57.5 million Btu/hr.

This furnace has eight passes of longitudinal plain tubes in radiant section in lower part of unit, with finned extensions of these tubes in upper convection section. Each pass contains seven tubes. All tubes are carbon steel.

All of tubes on this heater have 180° return bends. Use of return bends rather than a header lowers capital cost. Also without joints, coke cannot get behind rolled joints and force tube away from header. Hence, this potential source of leakage is eliminated. However, return bends do prevent easy removal of coke or drainage of water in preparation for wall thickness measurements with a Penetron.

Cone inside of furnace in upper portion is most important element in design to provide even distribution of heat. Small, hot cone tip reradiates to tubes across a considerable distance. Because of conical shape employed, each higher

To page 84

Announcing the New Jerguson MAGNETIC GAGE For Liquid Levels



An important advancement in liquid level observation for plants with dangerous explosive or inflammable conditions.

Safety design seals against escaping gases.

Measuring mechanism in stainless steel chamber.

Scale mounted outside chamber; magnetically actuated through chamber wall.

Distinct, accurate level shown in red contrasted with silver above.

Job designed, correlating pressure, temperature, and specific gravity.

Available with electric alarms.

Can also be used for interface indication.

Write now for engineering sheet on Jerguson Magnetic Gages.

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Gages and Valves for the Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY
100 Adams Street, Burlington, Mass.

Offices in Major Cities

In Canada: Peacock Bros. Ltd.

Check 3329 opposite last page

CHEMICAL PROCESSING

THAT'S
INTERESTING

High-temp agreement

All measurements of high temperatures in Canada, the U.K., Germany, and the U.S. now have a common basis. Precise international comparisons have established that the optical pyrometer temperature scales of the above countries are in satisfactory agreement.

Zinc foil process

A new, continuous process to produce zinc as a thin foil has been developed by American Smelting and Refining Co. Pilot plant is now turning out developmental quantities of foil in sheets ranging from 0.005 to 0.001" in thickness, and 26" in width.

Paved in plastic

Paving material of plastic called "Resilith" is undergoing tests on the upper roadway of the Queensboro Bridge in New York City. The "plastic" is a chemically contrived substance consisting of a resin, catalytic agent, and a hard stone-like material.



"Take a tip from me—

One slip can cost more than **USS Multigrip**"

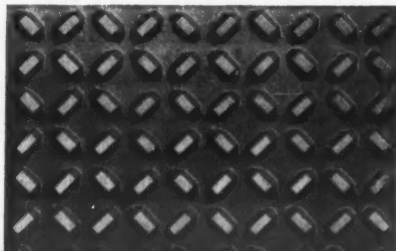
USS* Multigrip Floor Plate is specifically designed to help protect you against accidents from slips and skids. It will pay you to examine your plant or shop for possible accident-prone areas that could be made safe with Multigrip.* For it provides traction for feet and wheels at all times—in all directions.

Where floor surfaces take a pounding, USS Multigrip supplies a rugged, long-lasting cover. It's made from heavy-duty plate that will last for years without maintenance. Studded with hundreds of risers

in a symetrically designed pattern, their flat tops provide a greater bearing surface, reducing wear and prolonging the non-skid properties. Rugged though it is, it's comfortable to walk on and safe, wet or dry.

You save money on cleaning, too! A quick once-over with a broom or hose will get it spick and span. There are no pockets to hold dirt. Water drains quickly in any direction. Get USS Multigrip from our local distributor near you.

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Solve your EMULSIFICATION ...SEPARATION ...SEDIMENT REMOVAL problems ELECTRICALLY!

PETRECO ELECTRIC PRECIPITATION EQUIPMENT has been resolving oil industry emulsions for over half a century. It has been used successfully for:

- ▼ The separation of mixtures of insoluble liquid phases.
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- ▼ In refining, for contact treatment of hydrocarbons with acid or caustic solutions.
- ▼ In production, for resolving petroleum emulsions, and for purifying power oil for sub-surface hydraulic production pumps.
- ▼ Also, for sulfonation product separation and for separation of aluminum chloride catalyst complexes from raffinates, and for similar processing.

Petresco Electric Precipitation Equipment functions *automatically*. Demulsification, separation or sediment removal is fast and accurate—because intensity, contact time, and other process factors can be precisely controlled.

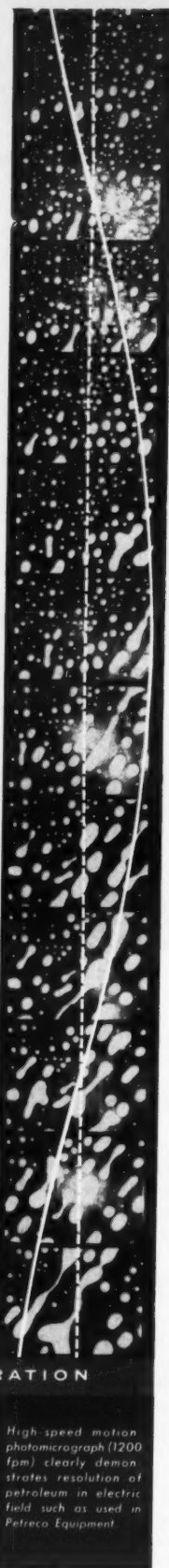
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Specialized Petroleum Treating Processes and Equipment
DESALTING • DEHYDRATION • DISTILLATE TREATING
SWEETENING • LUBE OIL TREATING • SEDIMENT
REMOVAL



High speed motion photomicrograph (1200 fpm) clearly demonstrates resolution of petroleum in electric field such as used in Petresco Equipment

Check 3330 opposite last page

PETROCHEMICALS

From page 82

element of cone is of larger area and closer to tubes than section below. These factors compensate for decrease in cone temperature from tip to base, provide relatively constant radiant heat transfer over entire upper tube length.

Cone also serves to divert flue gases along upper end of tubes, which adds convection heat transfer over this length. It also initiates a high rate of firebox recirculation of combustion products by cooling the gases in their passage across the tubes.

In addition to cone, optimum proportion for firebox and special burners with symmetrical flame pattern contribute to the quality of heat distribution. Extensive tests run by furnace manufacturer have shown the evenness of the temperature throughout the entire area of furnace of this design. This naturally contributes to the efficiency of the furnace and avoids local overheating.

During the period the furnaces have been in operation, some tubes have been straightened and some replaced. Tube life is expected to be about 3½ years. In general, furnaces have given good economical service. Majority of furnaces used in butadiene plants have been of this type.

(Petrochem-Isoflow furnace is product of Petrochem Development Co., Inc., 122 East 42nd St., New York 17, N. Y.)

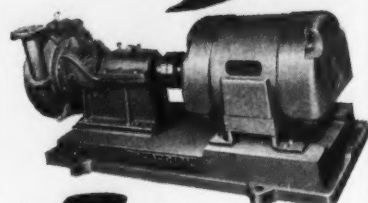
Check 3331 opposite last page.

(Texas Butadiene plant was engineered by the Fluor Corporation, 2500 S. Atlantic Blvd., Los Angeles, Calif.)

Four urea processes, originally developed by Montecatini and adapted to conditions in this hemisphere by M. W. Kellogg, are covered in brochure. All four processes offer urea with a low biuret content and provide conversion approaching 100%. Flow sheets for each process are included. Brochure on urea processes — The M. W. Kellogg Company, subsidiary of Pullman Incorporated, 711 Third Avenue, New York 17, N. Y.

Check 3333 opposite last page.

Custom-built for
**EFFICIENT
DEPENDABLE
SERVICE**



Frederick SSV PUMPS

**Enclosed Impeller
and Open Impeller Types**

You're sure of maximum service and output with minimum maintenance or production down time with Frederick SSV Centrifugal Pumps because each pump is custom-made to fit your particular operation—whatever the consistency or type of liquid you're moving.

SSV PUMP FEATURES

- Pump sizes from 1" to 4" discharge openings.
- Pump capacities from 50 up to 700 U.S. GPM.
- Heads from 30 up to 220 feet.
- Pump speeds can be varied to suit the driving media and operating conditions.

CONSTRUCTION ADVANTAGES

Pump casings are vertically split for easy accessibility. Mounted on a swivel to permit placing discharge in any desirable position. Pump openings, both suction and discharge, flanged to permit easier connection and disconnecting to joints. One-piece impellers, securely attached to shaft by stout key and lock nut, or threaded, give long service. Pump bearings mounted in sturdy frame horizontally split for easier accessibility. Extra long stuffing box provides for oversize stuffing. Mechanical seal also available for minimum leakage. Pump coupling flexible for direct connection to drivers or can be arranged for belt drive. Pump speed, pump openings, etc. are selected to suit your particular requirements.

Write for Bulletin No. 107



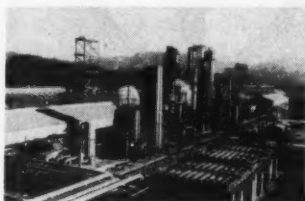
FREDERICK IRON AND STEEL, INC.
FREDERICK EST 1890 MARYLAND

Check 3334 opposite last page

CHEMICAL PROCESSING

**Petrochemicals growing
in Formosa**

In the wake of progressive expansion of the Kaohsiung Refinery, of Chinese Petroleum Corporation (CPC) in Formosa, the petrochemical field is sprouting steadily. A catforming unit and a catalytic cracking unit — completed a few years ago at the refinery — are providing basic raw materials required for manufacturing petrochemicals.



Urea plant in Formosa

Instead of consuming as fuels, more than ten thousand metric tons of dry gases and LPG will be furnished to the Kaohsiung Ammonium Sulfate Corporation for conversion into carbon monoxide and hydrogen through a synthesis gas generation process. Synthesis gas produced will be used for making ammonia.

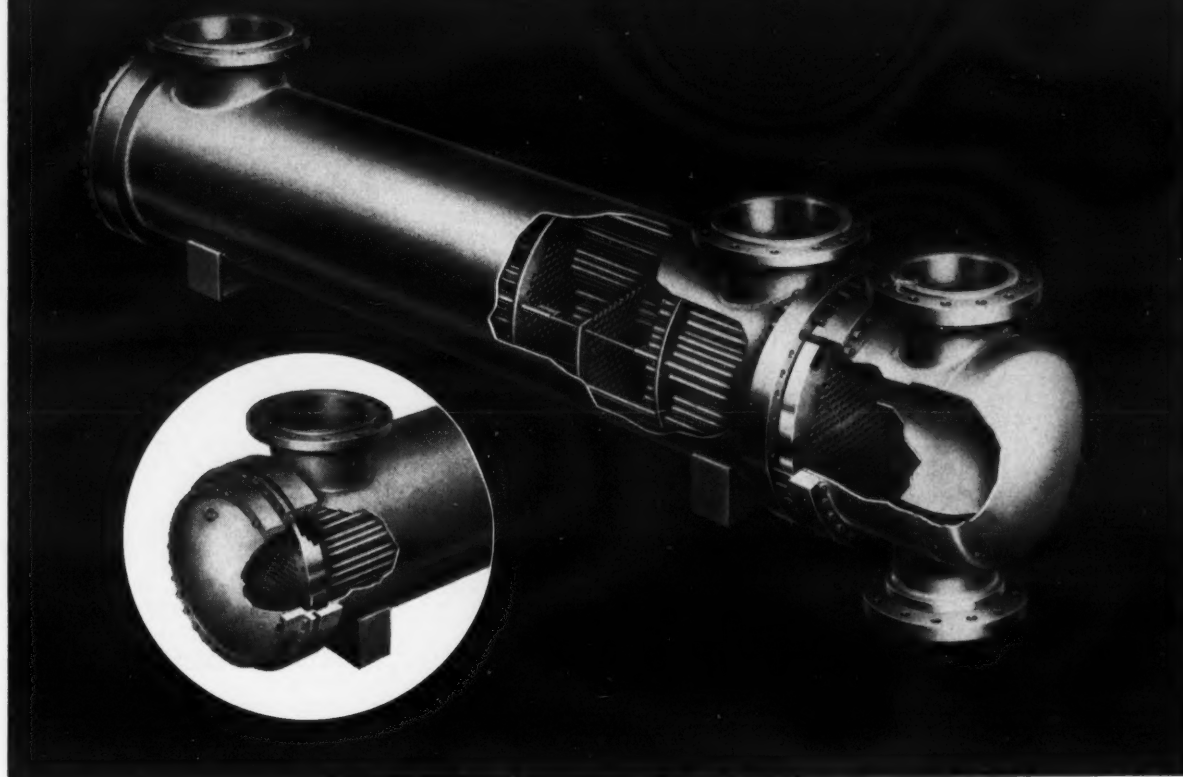
CPC is installing a sulfur recovery unit at the Refinery for recovering sulfur from cracking gases. Company is building an aromatics extraction unit at Chiaye for extracting benzene, toluene, xylene and other higher-boiling aromatic solvents from reformate produced from an Atlantic catforming unit.

A limited quantity of carbon black is being produced from natural gas by a conventional channel process. Consideration is being given to a new carbon black plant using the Lynn process, which can make carbon black from natural gas as well as from refinery waste gases.

Formosa is rapidly enlarging its fertilizer industry. A 29-million-dollar urea plant is now being built. Coke will be the principal raw material.

Most of the equipment being installed in the new petrochemical and chemical plants was made in the U.S.

NEW! FULLY STANDARDIZED EXCHANGER OFFERS UNPRECEDENTED FLEXIBILITY



down go costs and delivery time for the process industries

It's here . . . the most versatile heat exchanger ever developed for the chemical industry — the Ross C-100. Of quality construction throughout, it is pre-engineered and fully standardized, by-passing high costs and delays inherent in custom fabrication.

Readily assembled to handle any combination of liquids and gases, the C-100 can be used as a heater, cooler, condenser or vaporizer for hundreds of process applications.

Extreme flexibility predominates . . . in materials, sizes and arrangement of components, mounting position, tubeside passes, nozzle orientation. Your choice is virtually limitless in meeting a tremendous range of conditions.

Want specific details? New illustrated Bulletin 302.5K1 will bring you all the facts on design, materials, sizes and adaptability. Send the coupon for your copy.

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ROSS HEAT EXCHANGER DIVISION

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CP 159

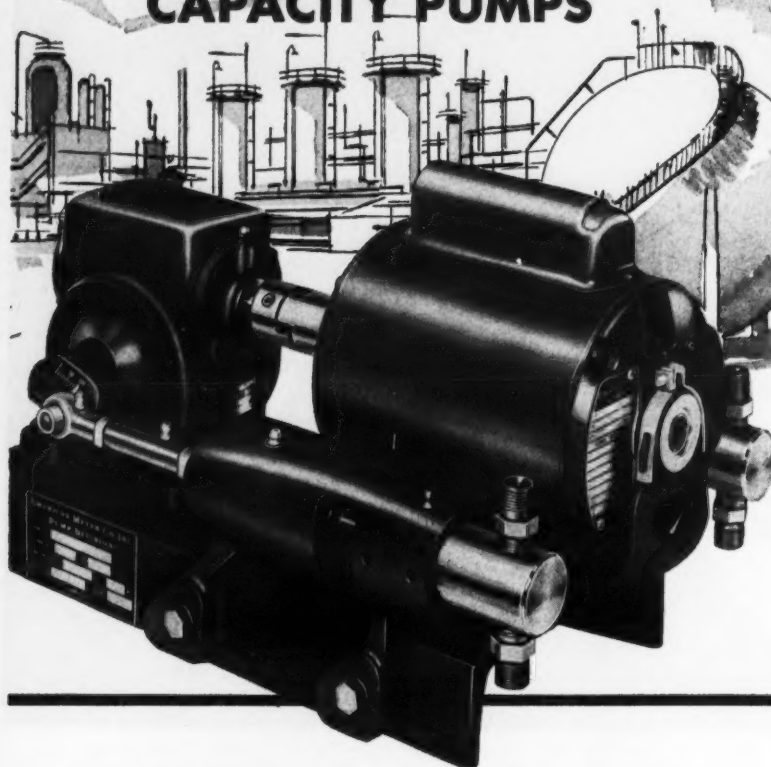
Please send your new illustrated Bulletin 302.5K1 fully describing the Ross Type C-100 Heat Exchanger.

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Check 3335 opposite last page

NEW

AMERICAN CONTROLLED CAPACITY PUMPS



JOB ENGINEERED FOR LONG-TERM ACCURACY AND LOWEST MAINTENANCE COSTS

New American controlled capacity pumps are precision built to meet the needs of Chemical Processing, Refining and Boiler Feed applications. Quality construction assures highest accuracy in feeding precisely metered fluids or slurries into low or high pressure systems in virtually all desired ratios, with flow, temperature, pressure, conductivity, PH and other controlled process variables. Control may be manual or automatic—with electric, hydraulic or pneumatic systems.

Newly designed models are available to handle a wide variety of "tough," corrosive and viscous materials.

Write today for full information on American's new controlled capacity pumps. They're sure to meet your fluid proportioning requirements.

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INCORPORATED ESTABLISHED 1934
pump division

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Check 3336 opposite last page

PETROCHEMICALS

Top entry check valve designed to prevent corrosion

Top entry double-union check valve for oil process lines is insulated against electrolytic action. This prevents damage from galvanic action to pipes and equipment in the flow system.



Top entry permits easy accessibility to interior of check valve

Valve has a bronze clapper, designed to provide quiet operation and effective closure when flow pressure drops. Full opening passage is provided for line cleaning and removal of paraffin and other deposits.

Quick removal and replacement of parts is possible through valve's top entry. Unit operates under pressures up to 500 psi water-oil-gas or 300 psi steam.

(Top entry check valve is product of Clayton Mark & Company, 1900 Dempster Street, Evanston, Illinois.)

Check 3337 opposite last page.

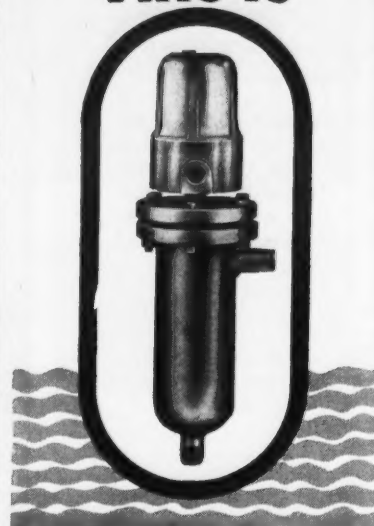
Slide rule selector which comes in pocket size makes easy selection of correct size and type of liquid level gages and valves. Selector chart gives size numbers, visible glass and center-to-center connections for complete line of company's gages in all types and pressure groups. Slide Selector — Jerguson Gage & Valve Co., 80 Adams St., Burlington, Mass.

Check 3338 opposite last page.

Standard meter tubes are described in 20-page catalog which details their features and specifications. Also included is considerable engineering design information. Cat Sec "D" — Daniel Orifice Fitting Company, PO Box 19097, Houston 24, Texas.

Check 3339 opposite last page.

This is



LEVEL MASTER[®]

The UNFAILING Liquid Level Control!

The ability to function with continuous, sensitive control with liquids is the standout feature of Level Master. The "brain" of Level Master is the unique Bell Magnetic Proximity switch incorporating a permanent Alnico V magnet that responds instantly to changes in liquid level!

- Models for all types of liquids.
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Send full information on Level Master and name of nearest representative.

My name _____

Company _____

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City _____ Zone _____ State _____

Check 3340 opposite last page

CHEMICAL PROCESSING

chemical company.

I believe technical ambitions of a company should be tailored to existing or potential assets. Many promising research accomplishments have failed not through any fault of the scientist or engineer, but because the company did not have resources with which to capitalize on development.

In Pennsalt, based on our own particular assets, we have defined six broad fields within which we are doing research. We believe that by confining our research activities to these six fields we stand a far greater chance of increasing profits through research than if we were to scatter our research efforts. Actually, we have a seventh field, "Exploratory Research," from which we hope will be developed the fields of concentration in years to come.

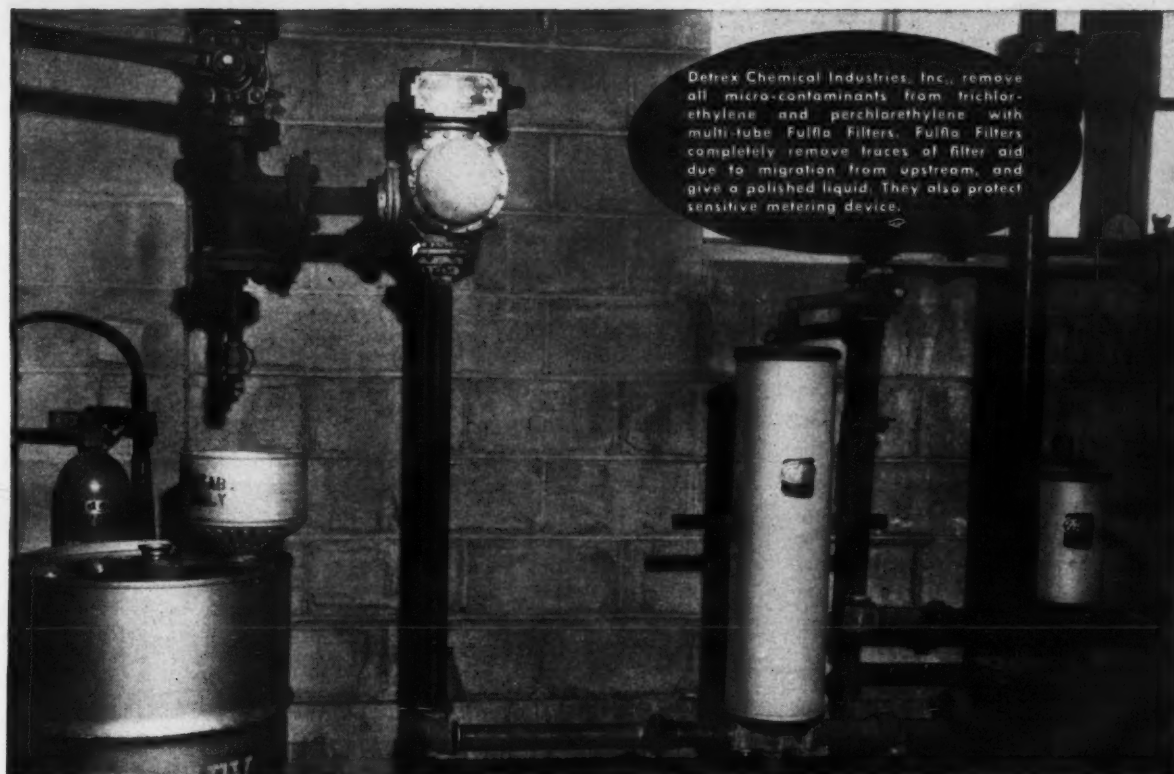
Our research tools consist of organization, environment, money, and facilities. We have centered responsibility and authority for all research and development activities under a technical director at the vice president level. This provides cohesive direction to such facets of the program as commercial development, basic research, process design and improvement, patents, and plant engineering.

Under present centralized system, every aspect of a product and its manufacture is considered before a decision is made. Although the director seeks help from any part of the company, the final decision — and the responsibility for executing it — rests with him.

When the time comes to put the product into commercial scale production, he has the task of selling an operating division manager on accepting the product, or if it does not fit into the existing marketing pattern, he may have to sell management on creation of a new operating division.

The story of our development of the Isotron line of refrigerants and aerosol propellants is an example that encourages us to believe that our approach may be sound for Pennsalt.

Our assets perfectly suited



PROTECTION IN THE LINE

Detrex assures product quality — protects instruments
with **Fulflo Filters**

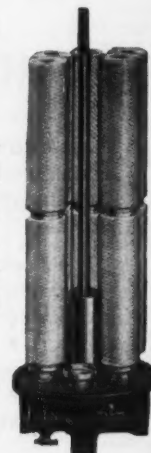
To maintain rigid quality standards, Detrex installs Fulflo Filters in line at final packaging in drums of trichloroethylene and perchlorethylene. Fulflo Filters assure micro-clarity of the final product by removing all impurities. Fulflo Filters also protect the sensitive instrument used to meter the final product. This means definite savings in maintenance costs.

These Fulflo Filters have been in use at Detrex for over five years, with excellent results in product clarity,

equipment protection, and reduced maintenance costs.

Fulflo Filters, with genuine Honeycomb Filter Tubes, provide continuous micro-clarity for all types of industrial fluids — chemicals, oils, liquid fuels, compressed air, water and many others. Models are available for high or low flow rate, pressure, pH, viscosity, and temperature.

Write for technical literature or engineering assistance to Department. CP



COMMERCIAL FILTERS CORPORATION

MELROSE 76, MASSACHUSETTS

PLANTS IN MELROSE, MASSACHUSETTS AND LEBANON, INDIANA

MICRO-CLARITY AT MINIMUM COST



with genuine Honeycomb Filter Tubes for controlled micro-clarity of industrial fluids.



Selective filtration of oils • water-oil separators • magnetic separators • pre-coal filters • coolant clarifiers • automatic tubular conveyors.

Check 3341 opposite last page

Rugged, Sensitive Temperature Transmitter



Measuring Spans
of 50°, 100°, 200°, 300°, and 400° F.
are easily set as required
within over all transmitter range
of -100° F. to +1000° F.

Stable Operation
Single lever, single pivot,
force-balance system provides stable,
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Fast Response
Highly sensitive, low-volume,
gas-filled bulb and minimum length capillary
assure maximum speed of response.

High Accuracy
Full compensation for ambient temperatures
and pressures helps maintain
highest calibrated accuracy.

Low Cost Installation
Standard 3-15 psi output signal
requires only low cost tubing
for transmission to
any recorder or controller.

... IMPROVES REMOTE CONTROL

There's no easier, simpler way to measure remote temperatures, over so wide a range, with such high sustained accuracy and speed, and at so low a cost!

The Foxboro Type 12A Pneumatic Temperature Transmitter converts temperature measurement to a linear output signal, which is transmitted to any standard 3-15 psi recorder or controller. Fully compensated for ambient temperatures and pressures, this rugged, highly responsive instrument performs outstandingly under the most severe condi-

tions. And it's insensitive to mechanical vibration.

The transmitter weighs only 7 pounds with its integral mounting bracket. It can be mounted anywhere . . . in any position . . . even directly on a bulb well! The gasketed, weatherproof housing permits installation in any location.

Write for Bulletin 13-17. It explains fully why the Type 12A Temperature Transmitter gives better performance with lower installation and maintenance. The Foxboro Company, 811 Norfolk St., Foxboro, Mass., U.S.A.

FOXBORO

REG. U.S. PAT. OFF.

Pneumatic Temperature Transmission

Check 3342 opposite last page

Leaders View '59

From preceding page

the company's entry into this field. Our manufacturing history, our experience with chlorine, fluorine and organic chemicals, and our own sources of raw materials made this a "natural" for Pennsalt.

In 1955, a target date of January 1, 1957, was set for Pennsalt's commercial production of these chlorofluorohydrocarbons. Because of uncertainty of time required to develop our own process, it was decided to buy the best available process.

Coincident with the quest for an outside process for Isotrons 11 and 12, the company organized its own research program to develop a process for Isotrons 22, 113, and 114. The outside process for Isotrons 11 and 12 was found from a foreign source and the plant for their production went onstream in the late fall of 1956. In the same period, Pennsalt research scientists developed a successful process for Isotrons 22, 113, and 114, which had as an extra "plus" the production of Isotrons 11 and 12 in the same plant.

This development was the result of utilizing all important Pennsalt assets which could contribute to its success.

The project was completed on schedule because of the concentrated effort of a team of administrative, technical, engineering, and production experts. Sufficient financial support was provided. Dollars budgeted for the two-year project for development of Isotrons 22, 113, and 114 exceeded substantially that of any single project in the company's history.

Salts, fluorspar, HF, and chlorine — all raw materials required in production of Isotrons and ones with which Pennsalt had had years of experience — were readily available. Chlorine and HF both were produced at the same location, and the company's own fluorspar mining and milling operations were just a few miles away.

We are always hopeful that out of our research efforts shall come products "new to man"; however, we recognize that this cannot be the sole, or

even the most important criterion of successful research. Research can be just as profitable — in fact, sometimes more profitable — if it results in products new to the company, or processes which produce an existing company product at lower cost or of better quality.

No matter in what area we do research, success is more certain if we follow the guidepost of utilizing our own assets — technical know-how of our scientists, direction of management, and skill of our engineers and production personnel. And of course the final asset is selling ability. No one ever made a profit until the product is sold.

Bulging Euromarket

From page 30

will balance out and eventually a trade surplus in favor of Euromarket industry might develop. This development will partly be the result of European investments by the U. S. chemical industry.

No Time to Lose

Companies planning to enter the Euromarket have no time to lose. Europeans are in full swing making preparations to take advantage of expected market expansion. With internal tariffs gradually declining to zero and external tariffs fluctuating, depending on the present level in each of the six countries, it can be expected that European chemical companies will further pool their resources.

Companies planning to operate in Euromarket are advised to begin with their own sales organizations. These firms will initially sell imported material and gradually develop towards local packing and simple processing procedures into a full-scale production and sales operation. It may be more appropriate to consider a temporary loss on imported merchandise — loss one can keep under control —

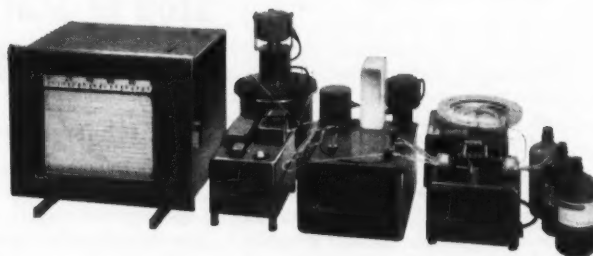
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Highest Precision,
Automatic Chemical Analyses ...**

ON-STREAM

with the *AutoAnalyzer*[®]

The Technicon AutoAnalyzer is a simple control system for continuous quality control of the highest precision. Standardizes product by continuously controlling variables in every stage of production. Insures production time scheduling and eliminates reruns.

For complete information plus detailed application data about the AutoAnalyzer, use the coupon below. No obligation, of course.



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Gentlemen:

Please send me the TECHNICON AUTO-ANALYZER BROCHURE plus other pertinent data. I am particularly interested in the following applications:

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| <input type="checkbox"/> Control of Constituent Proportions |
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| <input type="checkbox"/> Assay <input type="checkbox"/> Purity <input type="checkbox"/> Pollution |

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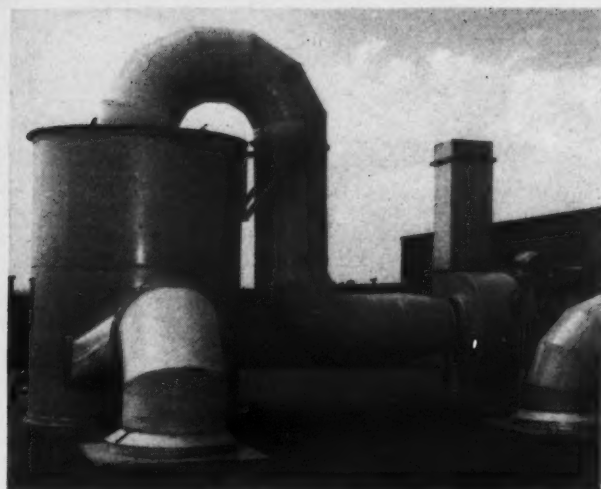
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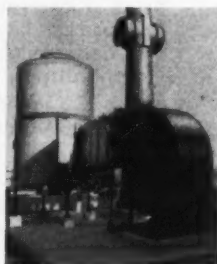


FUME SCRUBBERS

Widely used and proven in service, Heil Fume Scrubbers are built in several designs, and in standard sizes from 1,000 to 30,000 C.F.M., thus speeding delivery and minimizing your engineering costs.

Heil Scrubbers are moderately priced and operate with low pressure drop, minimizing fan requirements. Water can be recirculated; reducing the amounts of new makeup water required. There are no moving parts, nothing to wear out. Completely acid and alkaline proof construction assures maximum service life. Those built of Heil Rigidon (reinforced plastic) are light in weight, and usually can be installed on roofs without the added costs of reinforcing beams and trusses.

Let the Heil Corrosion Engineers, with 29 years experience, analyze your requirements, recommend the size and type of standard or special scrubber you need; also the auxiliary collecting hoods, ducts, fans and stacks, so that you have an efficient, dependable, completely corrosion-free system.



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HEIL PROCESS EQUIPMENT

CORPORATION

12901 Elmwood Ave. • Cleveland 11, Ohio

Check 3344 opposite last page

Bulging Euromarket

From preceding page

than to accept later losses on idle capacity of production units.

This start from scratch takes time. Technical and marketing problems will almost certainly develop and become a handicap for a fast start. This is the reason why several U. S. firms prefer a running start through a joint venture operation. As time passes, however, the number of European firms eligible for a profitable joint venture becomes smaller and smaller.

During the 12- to 15-year transitional period, in which Europeans plan to establish their new market, U. S. chemical industry will be faced with a series of new product developments and structural market changes which will outpace the need for export and import adjustments. Total market for chemicals probably will more than double in this period.

Ties between European and U. S. companies will become more complex. The chemical industry will become one of the most diversified and most international industries in the world.

We feel that European companies will gradually integrate with American chemical companies so that one Euro-American chemical family will emerge.

Group Invention

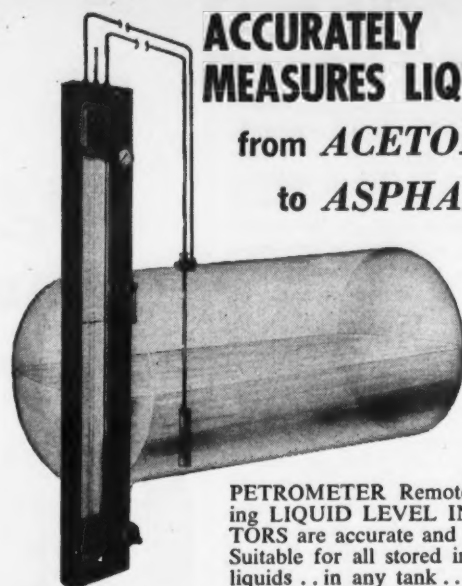
From page 31

ference of management to specific idea areas can all be part of these forces.

The upshot is that new product ideas must be sold vigorously within the company itself. In such internal sales, a group can be a more effective instrument than an individual.

Here's An Example

On several occasions an ADL group has undertaken to develop new products for a company, only to discover that someone within the company — a member of research and



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MEASURES LIQUIDS
from ACETONE
to ASPHALT**

PETROMETER Remote Reading LIQUID LEVEL INDICATORS are accurate and reliable. Suitable for all stored industrial liquids . . . in any tank . . . at any distance. Easy to install . . . and easy to read. Indicators have many unique design features.

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PETROMETER

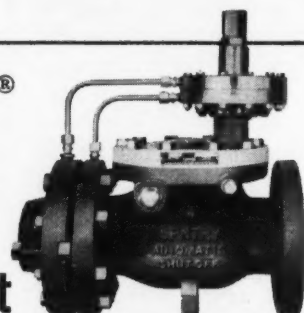
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Check 3346 opposite last page

CHEMICAL PROCESSING

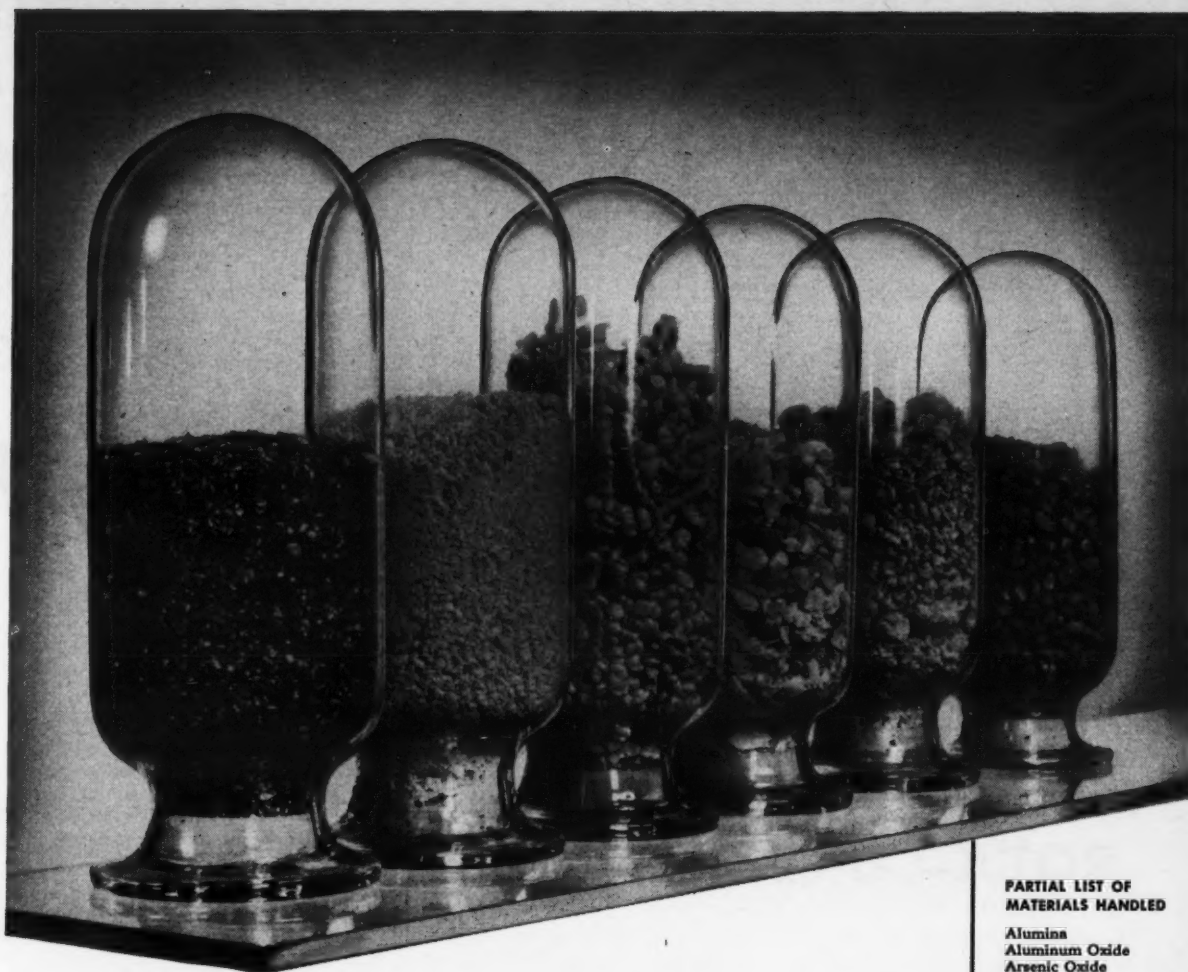
development, or a production engineer — has already developed several promising new product ideas which he had not been able to sell internally.

In one case a young chemist had presented his superiors with six new product ideas within a year. Some had been carried to the point of rough prototype models. In each case management had reviewed and peremptorily dismissed the idea. Dismissal was sometimes on economic grounds, sometimes on basis of technical infeasibility, although no one questioned the chemist's technical ability, and no very concrete objections were raised explicitly.

When his ideas were reconsidered at our suggestion, several were found worthy of further exploitation. One class of ideas seemed so promising that a separate group was formed with the chemist as leader.

The group is now serving not only to develop this family of ideas but to generate new ones. With additional weight and prestige, the group is more successful in bringing its ideas to the point of implementation.

Thus the ability of the invention group to overcome the inherent organizational inertia can be a major advantage. No argument is made as to the inventiveness of the individual versus the group. But it is believed most significant that the weight of a group, with an improved presentation, often succeeds in pushing a promising idea through an organization where an individual would fail.



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Arsenic Oxide
Asbestos Dust
Barite
Bauxite
Bentonite
Borax
Calcium Carbonate
Carbon Black
Catalysts, Petroleum
Cement, Portland
Cement Raw
Material
Chalk
Clays
Coal, pulverized
Detergent Powders
Diatomaceous Earth
Feeds, soft
Fertilizers
Flour
Flue Dusts
Fly Ash
Gypsum
(raw or calcined)
Lime, pulverized
Malt
Ores, pulverized
Phosphate Rock, pulverized
Resins, synthetic
Salt
Silica, pulverized
Starches
Sugars, refined
Talc

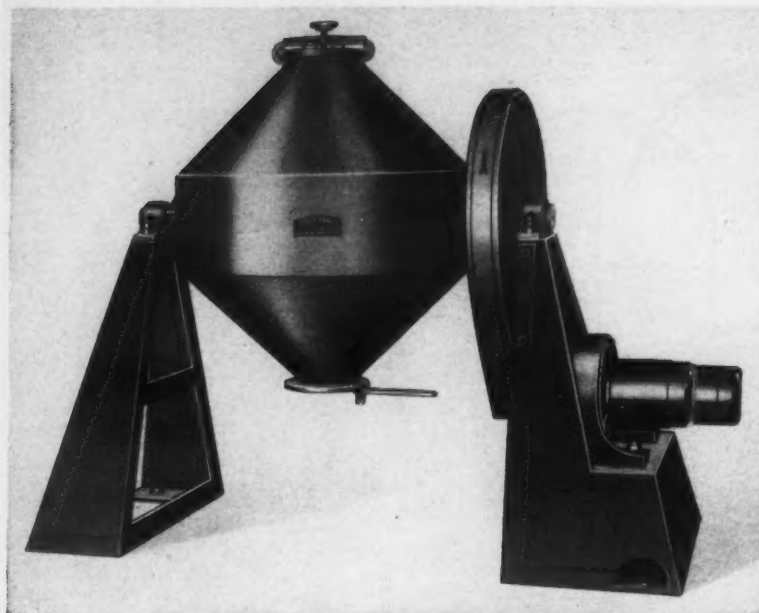


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LOW PROCESS COST.**

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Polyethylene Markets

From page 32

ing the polyethylene onto the board. One extruder, Lowe Paper Company of Ridgefield, N.J., has successfully licked this problem with a low-cost dextrin or starch adhesive. First commercial application is a carton for suppositories which have been a problem for grease-proof packaging.

What About Waste

Even after the paper or board has been manufactured, problems remain. Waste in paper and board trim can average as much as ten percent, and as yet there is no good economical process for recovery of the material. Clear waste poly can be sold, as can waste paper and board. But coated material cannot be salvaged and must be burned to dispose of it.

Paper board converter waste, in addition, can run as high as 36%, even though the average now is about 18-19%. This is also non-salvageable waste, adding to the cost of the final product.

One or two experimenters in the field have indicated that suitable processes for recovery of this poly-paper waste may already be developed, even to the pilot plant stage. If true, this would solve a major share of the difficulties.

Importance of Market

How important is poly extrusion-coating today? Estimates are that it represents about 5-6% of the total polyethylene produced. But this pales into insignificance when compared with only some of the possible applications for poly-coated paper and board — concrete forms, irrigation ditch liners, wallpaper, disposable dishes, pressure-sensitive tapes, milk cartons, frozen food packages, fertilizers, and on for an almost endless list.

Present problem, even if all the problems of application and disposal had been solved, is over-capacity of the industry. For many reasons, it is relatively easy to enter the field. And, extrusion coaters say they can almost always feel the immediate effect of a new entry. Total capital ex-

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Moisture is eliminated from product in much the same way as from a sponge submitted to a series of alternate compressions.

Working in conjunction with standard drying techniques, a Multiwhistle installation can reduce drying time up to 30% without harm to product.

Installation is simple; no moving parts, no maintenance. Operates on air or gas pressure of 40 to 70 psi.

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VIBRO-CERAMICS DIVISION



Gulton Industries, Inc.
Metuchen, New Jersey

In Canada: Titania Electric Corp. of Canada, Ltd.
Gananoque, Ontario

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CHEMICAL PROCESSING

penditure required is only in the area of \$250,000, not large by today's standards.

History of Extrusion Coating

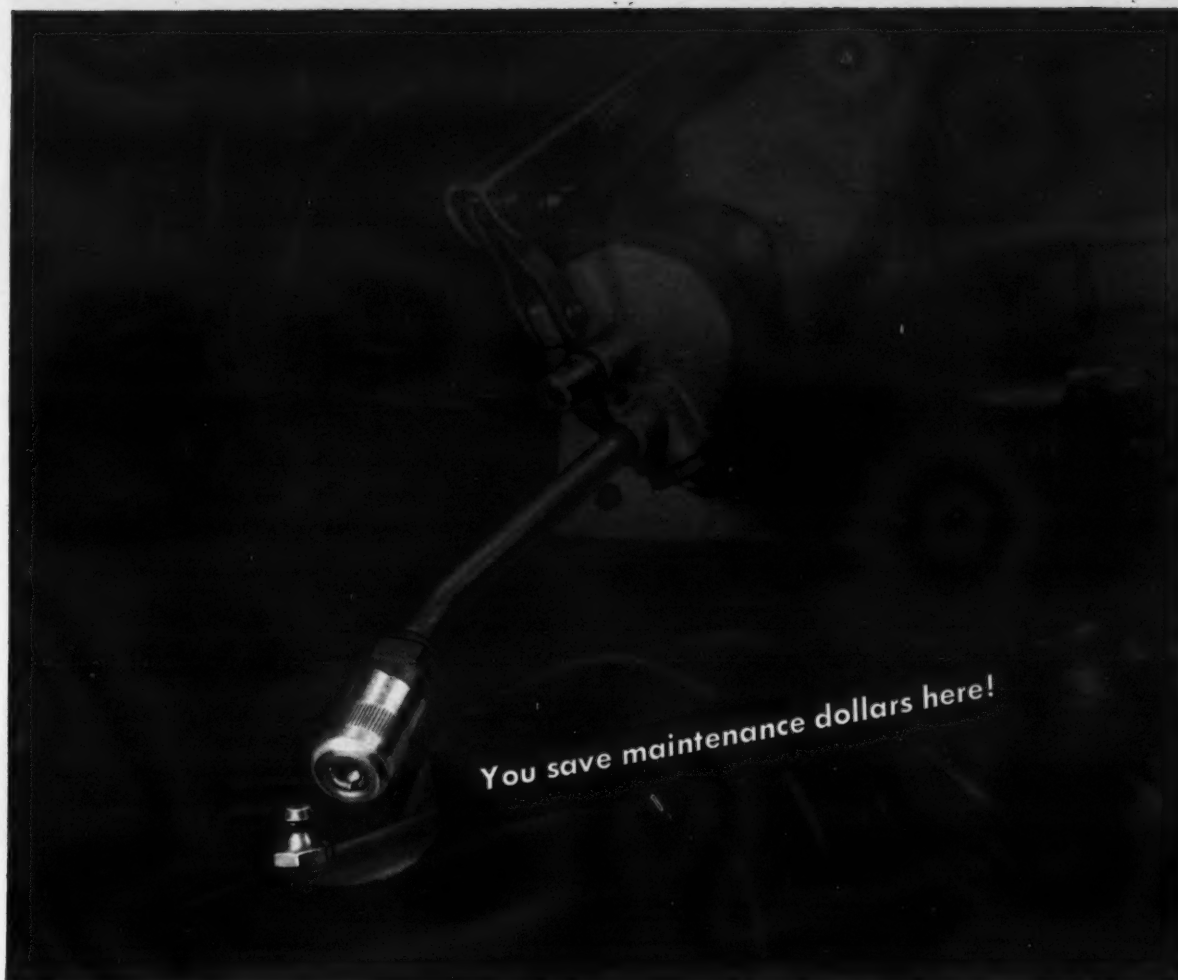
First investigated by Du Pont, coating of polyethylene onto kraft paper was so successful initially that a number of paper companies became very interested in the process. In 1949, St. Regis Paper Company became the first commercial producer of the coated paper. And in that year approximately 300,000 pounds of polyethylene were used in the coating field. The total is now close to an annual use rate of 30 million pounds for all extrusion coating.

In essence, extrusion coating consists of preparing a polyethylene melt at the sheeting die of an extruder. A film of the polyethylene is drawn down to its final gage as it leaves the die. Then this melt film is brought into contact with the material to be coated. The bond between the base material and resin is set by the progress of the material between the pressure and chill rolls.

Although polyethylene is available in a wide range of molecular weights, from 300 to 19,000, most coating is done within a range of 12,000 to 19,000. The actual weight is usually the subject of research, and recommendations differ according to the particular application. St. Regis Paper, for



"I wish those two boys would stop their feuding."



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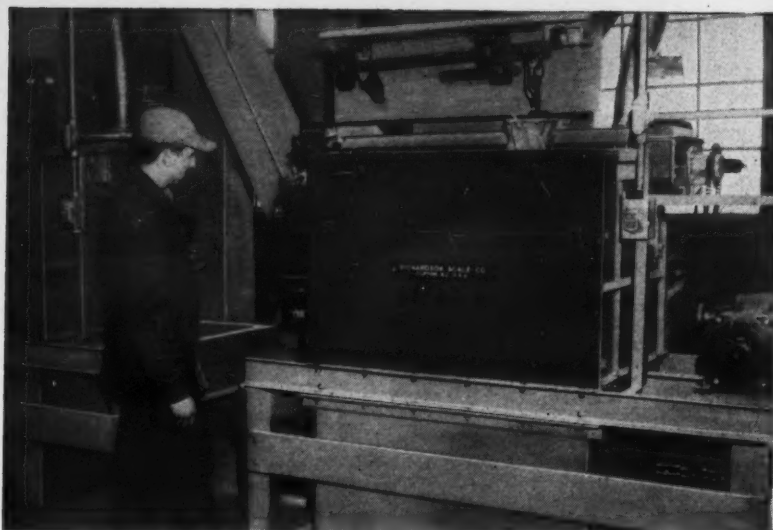
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RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY

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Also manufactured in Europe to U.S. standards

Check 3351 opposite last page

Polyethylene Markets

From preceding page

one, suggests a 19,000 molecular weight range as most satisfactory for its own coating purposes.

Another variable is the thickness of the film coated on the paper or board. Industry standard of coating on paper is in pounds per ream. Most polyethylene used at this time has an average specific gravity of 0.92. Calculation of weight using this figure produces a value of 14.4 pounds per ream for each mill thickness of coating.

Cost Data

Preliminary cost estimates on coating can vary widely. One extruder recommends, for example, that 20 pounds of polyethylene, priced at 46 to 48 cents a pound, be used to the ream. It has been estimated, on a very liberal basis, that cost of application by extrusion is approximately 4½ cents per pound applied. Of course, this will vary according to production rates, extruder used, and so forth. Another extruder suggests 80 cents per pound as necessary to recover cost.

The companies now in the extrusion coating field range widely in size. A late listing of those already active in the field shows seventeen, although many others are undoubtedly considering entrance:

J. D. Cahill Company

Continental Can Company, Inc.,
Shellmar Betner Division

Crocker, Burbank Papers, Inc.

Crown Zellerbach Corporation

Guardian Paper Company

International Paper Company

Lowe Paper Company

Ludlow Papers, Inc.

American Can Company
Marathon Corporation Division

The Mead Corporation

Riegel Paper Corporation

St. Regis Paper Company

Sealright-Oswego Falls Corporation

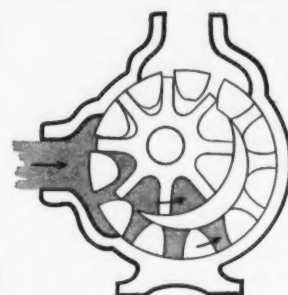
H. P. Smith Paper Company

Thilmany Pulp and Paper Company

Union Bag-Camp Paper Corporation

West Virginia Pulp and Paper Co.

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In Canada it's "ROTO-KING" pumps
See Our Unit in Chemical
Engineering Catalog

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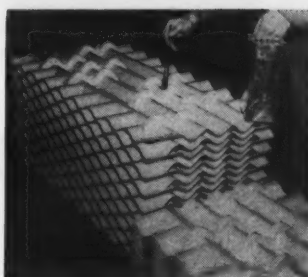
CHEMICAL PROCESSING

Plastic packing developed for biological waste treatment systems

A new tool in the field of biological oxidation has been introduced in the form of corrugated plastic packing material. Designed to improve conditions under which micro-organisms oxidize wastes, the lightweight product can be assembled in self-supporting units and stacked as high as 42 ft without difficulty.

Corrugated shape provides large surface areas to which waste-treating bacteria can adhere. In addition, it permits large volume air flow through packing to supply bacteria with necessary oxygen. Liquid waste flow rates in excess of 800 million gal per acre per day have been applied with no evidence of restricted air circulation.

Known as Dowpac, product is made up of many layers of corrugated sheets of polystyrene or saran, depending on type of chemical resistance needed. Because of its light




weight, about 1/20 that of conventional rock packing, material permits wide latitude in design of oxidation systems.

Field tests have been conducted with it in treatment of domestic sewage and wastes from metallurgical coke, kraft paper, ragmill, chemical, and petroleum. In addition to its use in oxidation towers, product can also serve as aeration device for activated sludge treatment systems.


(Dowpac was developed by The Dow Chemical Company, Midland, Michigan.)

Check 3353 opposite last page.


KNOX Tower Packings




Raschig Ring




Single-Partition Ring



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Tellerette



Bert Saddle

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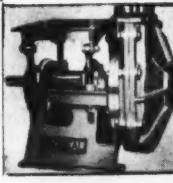
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SP-506A

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KUHNS

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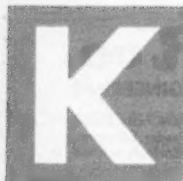
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TO PROVIDE LONGER
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If your biggest maintenance problem is downtime for replacing fittings, you'll be interested in the money saving advantages of Kuhn's Ductile Iron Pipe Fittings.

Their superior corrosion resistance, high strength and ability to withstand shock assure extra years of service, help reduce operating costs and simplify maintenance. Their smooth bore helps eliminate clogging, keeps systems working at maximum efficiency.

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* Kuhn's ductile fittings are listed and pressure rated by the Underwriters' Laboratories, Inc. All Kuhn's fittings are available nationally through better wholesalers.

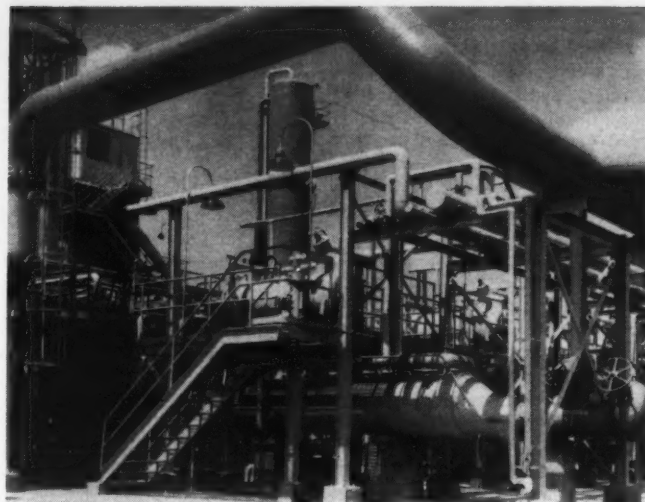


THE KUHNS BROTHERS CO.
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Check 3356 opposite last page



IDEAS: from other industries and nuclear field
— new trends in research, processes, services



Boron-based fuel plant soon to go on stream

Callery plant at Muskogee, Oklahoma will produce amber-colored liquid that will furnish heat considerably above the 18,500 Btu/lb of JP-4 fuel used by jets at present

GORDON WEYERMULLER, Associate Editor

Nation's first large-scale high-energy fuel plant, which was recently dedicated, will go into operation in early 1959. Plant, which is located at Muskogee, Oklahoma, was built at a cost of several million dollars less than the estimate of \$38 million. It is being built and will be operated by Callery Chemical Company for the Navy.

Heat Content of Fuel

Synthetic fuel to be produced, called HiCal, has a higher heat of combustion than present JP-4 fuel being used in jet planes. JP-4 has a heat content of 18,500 Btu/lb. Hydrogen has a heat content

of 52,000 Btu/lb. Hence, it is desirable to use as much hydrogen as possible in the fuel while maintaining other desirable properties. A gaseous material, such as hydrogen by itself, is not practical as a fuel.

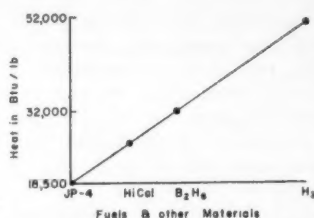
Boron also has a high heat combustion of about 25,000 Btu/lb. HiCal is made from diborane (B_2H_6), which is 78% boron. Diborane has a heat of combustion of 32,000 Btu/lb. Since it is also a gas, it is not practical as a jet fuel. Fuel consists of a compound composed of boron, hydrogen, and carbon. Carbon gives stability to material. Fuel has a heat content between the 18,500 Btu/lb of JP-4 and the

This equipment produces carbon dioxide and nitrogen from controlled combustion of natural gas. Tower in center recovers carbon dioxide

32,000 Btu/lb of diborane. It has been reported that the heat capacity of the fuel is about 25,000 Btu/lb.

A gas plant — which furnishes hydrogen, nitrogen, carbon dioxide, and ethylene for use in the process — has been completed and is ready to operate now. Although this plant is of conventional design, it is the first time that all four of these gases have been made in one integrated unit.

Ethylene is made by dehydration of ethyl alcohol, using a Dowtherm vaporizer and caustic scrubber. Hydrogen is made from natural gas in a reformer furnace. Monoetha-



Heats of combustion of present jet fuel, JP-4, and other materials. HiCal has heat between 18,500 and 32,000 Btu/lb

nolamine system is used for absorption of carbon dioxide. An inert gas generator produces nitrogen, which is used for blanketing reactive chemicals in plant.

Process consists of four separate operating units designated 100, 200, 300, and 400 areas. In the 100 area, the principal raw material is boric acid, which comes to plant as a powder in railroad cars. Boric acid is transferred by pneumatic conveyor to storage beneath first floor. From storage, material is moved by means of a Zipper conveyor to automatic weighing device on third floor. From here material passes to dissolvers.

In the 200 or second processing area, sodium is ob-



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in steel shipping containers!

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Vulcan offers a complete line of the finest quality pails and drums in all standard gauges. They are available with a variety of fittings and accessories. Vulcan will also recommend a HI-BAKE lining for your product or will work with you in developing a special lining. Whatever your precise steel container needs, Vulcan can fill them better and faster!



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Check 3357 opposite last page

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THE ONLY CENTRIFUGAL
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Fletcher Tornado-Matic unloader gives you these extra *exclusive* features.

- **Contamination-Free** . . . No lubricants to leak or seep on product. No teeth on which product can catch.
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- **Power Packed** Smooth unloading of difficult products.

Also available in manual and semi-automatic models
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Send me additional information on the Fletcher Tornado Centrifugal

NAME & TITLE

ADDRESS

COMPANY

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Check 3358 opposite last page

IDEAS

tained in tankcars and used in the reduction of boron in a batch reaction.

In the 300 or third processing area, diborane is formed. In the 400 or final processing area, the HiCal jet fuel is manufactured.

Surge basin for waste water holds 11 million gallons. An API separator is used in waste treatment. Waste gases are burned.

Fuel is an amber-colored liquid with a density slightly higher than that of hydrocarbons and about the same as present jet fuel. Product is loaded into one-ton chlorine cylinders for shipment.

HiCal is relatively expensive to produce in that it must be completely synthesized from elemental materials. It is hoped, however, that with large-scale production, the cost can be reduced to one dollar per pound.

Principal use for HiCal will be for ram-jets and turbo-jets. It conceivably might be used in rockets along with an oxidizer. Fuel could not be used in an internal combustion engine since it burns with a white smoke of solid particles.

After diborane is made in third processing step, plant is flexible so it is conceivable that solid fuel could be made.

Plant is like a petroleum refinery in that it employs a great many heat exchangers, along with much distillation and stripping. However, there is considerable handling of solids which would not be done in a petroleum refinery.

About 25 times as much steam is used as would be necessary in a petroleum refinery of comparable size. Reason so much steam is required is that a great deal of energy is needed to reduce boron from an oxidized form and get it into a form where it has high energy.

Plant uses nearly all of the chemical engineering unit operations, including centrifugation. One of unusual engineering achievements is a distillation column which handles both solids and liquids. In distillation much use is made of Koch Flexitrays. These units employ a small cap which

raises to permit gases to go up column and then closes. They provide about 20% less pressure drop in column and give greater mixing action.

(Callery Chemical plant at Muskogee was designed and constructed by The Ralph M. Parsons Company, working under the direction of Callery Chemical Company and the Navy Department. Gas processing unit was designed and built by The Girdler Construction Division of Chemetron Corporation, using an ethylene unit designed by Foster Wheeler.)

Extremely low pressures economically produced by cryopumping

Drops temp to -420°F ,
freezes air to form vacuum

Use of extremely low pressures in large scale industrial applications may soon be a reality, thanks to a recently developed technique. Known as cryopumping, the method can produce economically, pressures as low as one millionth of an atmosphere.

The technique is already being used in a wind tunnel for missile research at University of Southern California. The cryopump installed is essentially a low temperature refrigerator, using helium gas at -420°F as the refrigerant. At this low temperature all the air freezes out at one end of the tunnel, causing a vacuum, and providing high-speed air flow over missile models.

At present, cryopumping is most efficiently used in conjunction with mechanical pumps. Whereas the pumping speed of a mechanical system falls off rapidly as the vacuum increases, the cryopump works particularly well when a relatively high vacuum exists. The combined system makes use of the advantages of both methods.

(Cryopump was developed at Arthur D. Little, Inc., 30 Memorial Drive, Cambridge 42, Massachusetts.)

FILTER TIPS

by E.D. FILPAPER

SEEMS TO ME THESE FILTER CLOTHS
LOSE THEIR POROSITY MIGHTY FAST

THAT'S RIGHT, THEY'LL
SOON NEED CHANGING AGAIN

LOOK BOSS, HOW'S ABOUT USING THE
CLOTH TO SUPPORT NEW PAPER FILTERS
WHICH WOULD CATCH THE "CAKE"

WAIT TILL I CALL THE
E-D FILTER PAPER
EXPERT

USE THIS E-D FILTER PAPER #617
OVER YOUR CLOTH. THAT WILL
SAVE YOU A LOT OF
CLEANING TIME

SHOULD PREVENT
WEAR AND CLOGGING
OF THE CLOTH, TOO

NOW OUR VOLUME IS GREATER THAN
EVER... AND SEE HOW CLEAR THIS FILTRATE IS

IT'S ALSO CLEAR I'VE GOT AN
ALERT ASSISTANT WHO KNOWS
HIS E-D FILTER PAPERS

For more information, and FREE samples of E-D Filter Papers, write to



THE EATON-DIKEMAN CO.
Filtertown
Mt. Holly Springs, Pa.

"First with filter paper exclusively"

IDEAS

New health physics service announced — C-14 breath analysis

Samples analyzed, reports
sent out within 48 hr

A carbon-14 breath analysis service is now available for the benefit of persons or institutions working regularly with the radioisotope.

Using advanced scintillation counting techniques and a simple means of obtaining breath samples in which radioactive carbon dioxide is measured, the service group is able to provide clients with results accurately and inexpensively. Measurement of body burden can be made to as low as 1/30 of the maximum permissible levels.

Service is available on a flexible yearly contract basis. Price per analysis, on basis of 25 or more analyses, is \$4.75. Subscribers receive an equipment kit containing plastic sample vials, mailing tubes, carbon dioxide absorber, balloons, mouthpieces, and instruction sheet.

Samples are promptly analyzed and reports mailed to subscribers within 48 hours from time samples are received.

Until now, it has been difficult for users of carbon-14 to determine amount of radioactivity they may have inadvertently ingested or inhaled. Film badges, used routinely to record exposure to gamma and hard beta rays, do not respond to the weak beta radiation from carbon-14.

Authorities agree that although there is little or no external hazard from carbon-14, there is a potential danger if this material is ingested or inhaled. The service group recommends that persons working regularly with the isotope submit breath samples for analysis at least once per month.

(Further information about carbon-14 breath analysis service may be obtained from New England Nuclear Assay Corporation, 575 Albany St., Boston 18, Massachusetts.)

Check 3360 opposite last page.



NEW

FROM U.S. GAUGE

SUPERTHERM dial thermometers

Engineered... to equal the premium quality and dependable performance of superior USG Grade AA Supergauge pressure gauges.

Priced... at a money-saving value that's news in itself.

Designed... in a range of styles and sizes to serve any plant in any industry with the most comprehensive line of indicating thermometers available from one source today!

NOW all your requirements for standard, filled system dial thermometers met with one top grade line that features all these specifications. See your USG distributor, or write for Catalog 205.

DIRECT READING—rigid, direct mounting; or "Multi-Angle" type

REMOTE READING—for temperature measurement up to 125 feet from indicator

4 TYPES OF FILLS—organic liquid, gas, vapor, mercury

ALL COMPENSATIONS—complete selection of case or capillary compensation available as required

29 STANDARD RANGES—covering temperatures from -350° to +1000°F

2 CASE MATERIALS—anodized aluminum or phenolic plastic

4 CASE SIZES—3½", 4½", 6" and 8½"

3 CASE STYLES—turret, front flange, or back flange mounting, with choice of bezel

FULL SELECTION OF BULBS—virtually endless combinations of bulb sizes, shapes, materials, and connections.



UNITED STATES GAUGE 
Division of American Machine and Metals, Inc. • Sellersville, Pa.

Check 3359 opposite last page

Check 3361 opposite last page

LEE

PROCESSING EQUIPMENT

PRECISION BUILT OF STAINLESS STEEL
TO YOUR SPECIFIC REQUIREMENTS



Style A
Two-thirds Jacketed
5 to 500 gal.



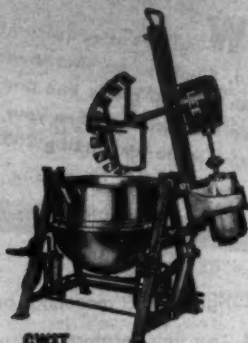
Style B
Full Jacketed
10 to 300 gal.



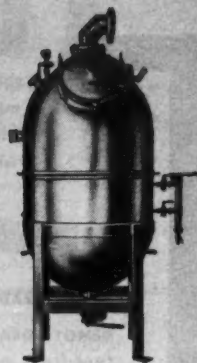
Style C
Two-thirds Jacketed
5 to 100 gal.



Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.



CWST
Center-line Scraper
Agitator Kettle—80 to 300 gal.



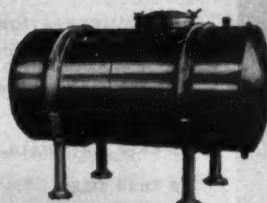
Vacuum Pan
50 to 500 gal.



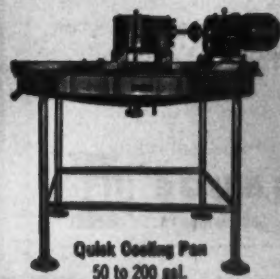
Style CW
Two-thirds Jacketed
80 to 300 gal.



Pulp Tank
500 to 2,000 gal.



Storage Tank
100 to 5,000 gal.



Quick Cooling Pan
50 to 200 gal.

LEE

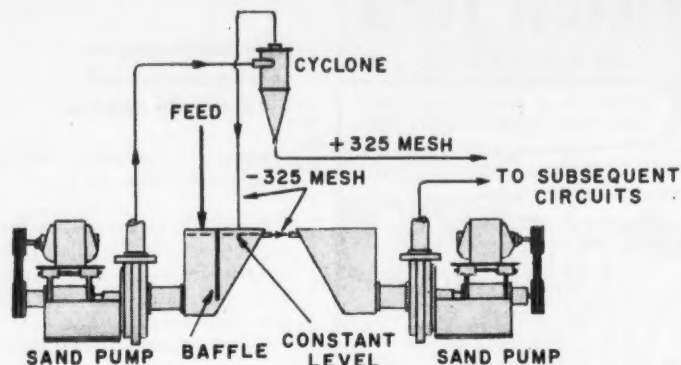
Technical bulletins
fully describing
these processing units
gladly sent on request.

METAL PRODUCTS CO., INC.

418 PINE STREET, PHILPSBURG, PA.

Designers and Manufacturers of
Corrosion-Resistant Processing Equipment
for over 25 years.

IDEAS



Helping to make satisfactory 325-mesh separations
in a uranium processing plant . . .

Pumping System Provides Constant Pressure for Wet Cyclone

Use of soft-rubber-lined sand pumps for handling
highly abrasive slurry eliminates excessive wear
on pump parts which would cause loss of pressure,
with resultant drop in classification efficiency

Success of any classification system using cyclones depends to a great extent on being able to feed the cyclone at a constant flow rate, thus maintaining constant pressure on the cyclone. Method shown in accompanying diagram has been found completely satisfactory for making 325-mesh separations at Western Uranium Corporation, Split Rock, Wyoming. In the uranium purification operation at the plant, a fluctuating level in the pump sump would cause corresponding change in pressure to the cyclone.

As illustrated in the drawing, a constant level is maintained in the sump which assures a constant volume and head on the feed to the pump. If the amount of feed to the sump falls off, the previously classified minus 325-mesh slurry provides the necessary

makeup feed to the pump to maintain a constant level in the sump. In some installations, gravity flow may allow elimination of the overflow pump.

On the cyclone operation at Western Nuclear, SRL (soft-rubber-lined) sand pumps are used because of their ability to withstand wear in the grueling, highly abrasive service. Since pressure is critical to cyclone efficiency, any appreciable wear on pump parts

Soft-rubber-lined sand pumps which
handle feed to cyclones at uranium
mill



Check 3362 opposite last page

Your plant needs

ROCKWELL VALVES

like these



"Kwikleen" slide valve for powdered coal, granular materials, flue gases with high solids content, etc.; solids accumulations easily cleaned out by removing bottom plate.

"Stress-seal" butterfly valve for tight shut-off of hot, corrosive or dirty gases to 1300° F. and higher, at 200 p.s.i. Alloy stress band in valve body is inflated by external gas pressure to effect tight seal.



Butterfly valve with simplified bracket and linkage to air operator and valve disc positioner; provides maximum adjustment, minimizes friction, eliminates backlash, chatter and hunting, reduces power requirement in close control applications.



"Slim-Jim" wafer type butterfly valve for low pressure air, gas or liquids; low cost, light, simple, space-saving, easy to install.

What's your valve problem?

W. S. ROCKWELL COMPANY

2208 ELIOT STREET
FAIRFIELD, CONN.

Check 3363 opposite last page

JANUARY 1959

IDEAS

would cause a loss of pressure and subsequent drop in classification efficiency.

All wearing parts of pump in contact with slurry are made of soft rubber, pressure-molded on steel supporting members. Pump, which employs an open runner, is constructed so that low brake horsepower is required to operate it. Unit is simple in construction, having less than 25 main parts.

(SRL sand pump is product of Denver Equipment Co., 1661 Market St., Denver, Colo.)

Check 3364 opposite last page.

SLA Translation Center —
valuable service that
cuts research delays

Offers handy, quick access
to foreign reports

The Special Libraries Association Translation Center, located at the John Crerar Library in Chicago, serves as the nation's central depository for translations of Russian and other foreign scientific materials. The Center got its start in 1953 when a translation pool was located at Crerar.

Restricted by a lack of funds and by a general unawareness of its value, the services at first were limited. Listings of translations on hand were made and distributed, and cards were indexed by author only. Then came sputnik, and the resultant awakening to the need and value of the Center. Purse strings were loosened and its services were expanded and improved.

Improved Card Service

To keep pace with the stepped-up post-sputnik demand for translations, especially Russian, the Center began a more efficient card service. Indexing, instead of being done by author only, was handled alphabetically and chronologically by journal source. This considerably simplifies the search for a translation.

Index cards carry information contained in *Translation*

**SLIPPERY
TEFLON
LININGS**

SPEED

**POWDERED
CHEMICALS**

... through hoppers, chutes, feeders, mixers, packaging machines, etc. **TEFLON**—the slipperiest, static-free, solid material known—keeps difficult powders and other dry materials flowing freely.

Eliminates need for vibrators or manual attention usually required to keep powders moving. This unique lining material is also corrosion and contamination proof.

Prevents delays . . . assists in automation of mixing, blending, weighing, packaging, tabletting and other operations.

Cementable TEFLON easily applied. Cementable **TEFLON**, Garlock No. 8536, with one side treated for application to metal, wood, glass, concrete, or other surface with standard commercial adhesives, is now available in economical thin-section (.005" to .060") continuous tapes up to 12" wide, and in 1/16" and thicker sheets up to 48" x 48" in size.

du Pont Trademark

For prompt service, contact one of The Garlock Packing Company's 30 sales offices and warehouses throughout the U.S. and Canada or write for Bulletin AD-158.

**United
States
Gasket**

United States Gasket Company
Camden 1, New Jersey

Plastics Division of
GARLOCK



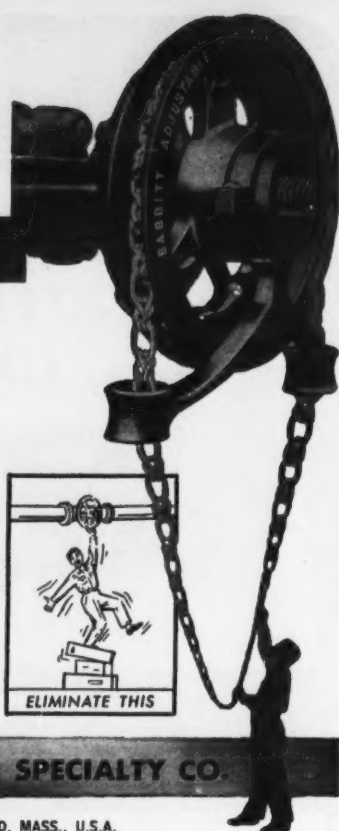
Check 3365 opposite last page

Safe Operation of Overhead Valves with a

Babbitt

Adjustable
SPROCKET RIM
with Chain Guide

- Simplifies pipe layout
- Fits any size valve wheel
- Easy to install and operate
- Operates any valve from plant floor
- Time and money saving fixture
- No maintenance; first cost only cost
- Packed, completely assembled, one to a carton
- Hot galvanized, rust-proof chain available for all sizes
- Easy to follow instructions with each unit
- Your supplier carries complete stocks
- Write for new descriptive catalog sheet and prices



Babbitt

STEAM SPECIALTY CO.

14 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

Check 3366 opposite last page

The Smart Trend in

PVA

EXTENDERS!

Tamms

GOLD BOND R
SILICA

A functional extender pigment especially adapted to PVA formulation for scrubability, leveling and flat sheen. It is easily wetted and dispersible. pH of 6.5-6.8. Non-crystalline structure. Economical in cost.

TAMMS INDUSTRIES CO.

RM 70 278 N LA SALLE ST CHICAGO 1, ILL

Check 3367 opposite last page

To
get
more
infor-
mation
on
products—
use the
Reader
Service
slip

opposite
last
page

IDEAS

Monthly, the Center's own magazine (\$5.00 per year) which lists the translations from all languages received during the preceding month. The magazine also lists new translations that can be obtained from nine other organizations in the U.S., England, Canada, Australia, and India.

Full coverage of *Translation Monthly* in card form (approximately 12,000 titles per year) is available for \$295. Coverage limited to Russian translations received in the Center (about 3100 titles) costs \$75 per year.

Translation Monthly was first published in January 1955. It now has 1234 subscribers and is sent all over the world. In June 1958, the Center began publishing a newsletter to serve as an information source to readers of the magazine. Through this medium, recent information on the advances being made to provide translated scientific literature to scientists and librarians is made available.

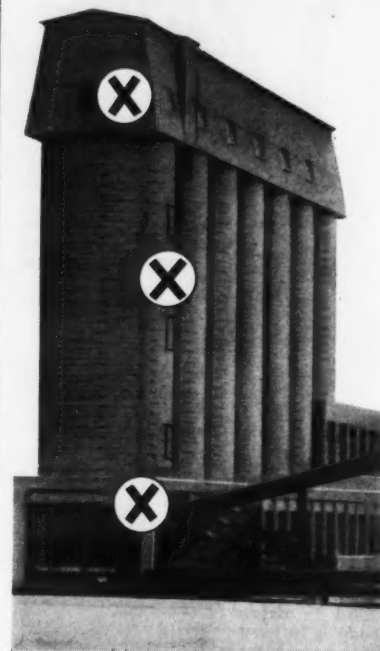
Has Over 23,000 Translations

The Center, which is supported by grants from the National Science Foundation, the National Institutes of Health, and the American Iron and Steel Institute, has collected and catalogued over 23,000 translations. Of these, 9085 are Russian. Translations are either loaned or sold as microfilm and photoprints. The great majority of requests are for the latter, since, in these forms, people are able to keep the translations instead of returning them to the Center.

Translations are available to anyone requesting them. Photoprints of a seven-page or less translation cost \$2.25. The charge for microfilm is less; a copy of a translation 25 pages long, or under, costs \$1.50. By using coupons, which can be purchased from the Center, regular users of the service can get discounts up to 13%.

Charge for the translation covers reproduction cost only. Operating costs for the Center and its four full-time employees are covered by the grants mentioned previously. Since

X MARKS THE CRITICAL SPOTS!



It takes
more than muscles to
build a storage bin

Before the physical work of building a bin begins, we must know the problems involved at the *Three Critical Points*.

- X What is the loading problem?
- X What are the characteristics of the material to be stored ... and its "flowability"?
- X What is the volume and rate of discharge?

When planning your next storage bin, may we sit in on the very early stages of planning?

NEFF & FRY COMPANY

166 Elm St., Camden, Ohio

N
& F

You can always
spot a Neff & Fry Bin
by the shape of
the stave

Check 3368 opposite last page
CHEMICAL PROCESSING

IDEAS

the original cost of a Russian translation is at least \$50, and sometimes as much as \$300, the Center's charges for its services are nominal indeed. Added to this is the quick service given — requests for photocopies or microfilm usually being filled within a week. Rush orders can be handled within 24 hours.

Various Contributors

The Center accepts all translations of foreign technical literature. Among its contributors are government agencies, universities, and industry. Companies usually lend their copies to be microfilmed or photostated. Most of the companies obviously do not want competitors in their field to know what technical reports they're translating. For reasons such as this, the Center does not divulge the source of its translations. However, if the Center cannot supply a particular translation, it does make an effort to tell where one can be obtained, such as from one of the many translating agencies in the U.S.

A popular misconception is that the Center does the actual translating which, of course, it is not set up to do. Frequent inquiries are received from people offering their services as translators and from people who want translating done for them.

The Center has made impressive progress since its inception. But, being a cooperative undertaking, its success depends upon the help of outside organizations. It needs more contributions to its collection of translations from industry (it has none from the chemical industry), and it hopes to win the recognition of more scientists who can gain much in time and valuable information through its services.

Board plant design and engineering services are described in four-page bulletin which contains flow-sheets of typical board plants and tabulation of potential markets for various types of board. Bul 8002 — Dor-Oliver Incorporated, Stamford, Conn.

Check 3369 opposite last page.

In Florida power plant...
**quantichem analyzer
 records dissolved oxygen
 colorimetrically
 0 to 30 ppb.**



EVEN a few parts per billion of dissolved oxygen in water for power station boilers reduces overall efficiency and economy. Three months ago, the Florida Power Corp., St. Petersburg, Fla., put on stream a Milton Roy Quantichem colorimetric analyzer in its Bayboro Station to survey dissolved oxygen in returned condensate from steam turbine condensers.

In addition to this application, other Quantichem automatic analyzers are available for analyses of silica (0-50 ppb), residual chlorine (0-3 ppm), hardness (0-3 ppm) . . . as well as for phosphates, hydrazine, chlorides, and many others.

Write for information on your particular application.
 Milton Roy Company, 1300 East Mermaid Lane,
 Philadelphia 18, Pa.



Controlled Volume Pumps
 Quantichem Analyzers • Chemical Feed Systems

Check 3370 opposite last page



**They compared
"K" factors and
cost factors
... and bought
SNAP*ON®**

For
more information
on product at
right, specify 3371
see information
request blank
opposite last page.



FOR FREE TEVA SURVEY CALL YOUR LOCAL
G-B SNAP*ON DISTRIBUTOR
(LISTED IN ADJOINING COLUMN)

Here's how to get maximum return on your insulation investment — simply specify Snap*On, the original one-piece pipe insulation molded of fine glass fibers. Snap*On thermal efficiency is such that you can use thinner wall thicknesses and save on your initial insulation investment. Long-term savings are equally impressive, for Snap*On retains its thickness and insulating efficiency indefinitely — is as permanent as glass itself. And Snap*On is virtually immune to damage, thanks to its resilient toughness.

Other Snap*On advantages: its "K" factor, low as that of any general purpose pipe insulation on the market... and economy of application, the lowest possible. Compare Snap*On in 3' or 6' sections, plain or jacketed, in sizes from copper tubing to 36", with any other pipe insulation — and see the difference! Just ask your local G-B distributor for a TEVA (Thermo-Economic Value Analysis) survey.

GUSTIN-BACON Manufacturing Co. 

254 W. 10th St., Kansas City, Mo.

Thermal and acoustical glass fiber insulations . . . molded glass fiber pipe insulation
Plain and grooved end couplings and fittings



G-B SNAP*ON DISTRIBUTORS

(See ad on facing page)

ALBANY, Ga., Industry Insulation Co.
 ALBUQUERQUE, Mt. States Insulation Co.
 AMARILLO, McDonald Engineering & Insulating Co.
 ATLANTA, Ga., Reynolds Aluminum Supply Co.
 AUSTIN, Texas, Cinbar Engineering Co.
 BALTIMORE, Md., Leroy Insulation Co.
 BILLINGS, Mont., Big Horn Supply, Inc.
 BIRMINGHAM, Ala., Shook & Fletcher Supply Co.
 BOSTON, Homans-Kohler, Inc.
 BUFFALO, Industrial Insulation Sales, Inc.
 CHARLESTON, W. Va., Baldwin Asbestos Products Co.
 CHARLESTON HEIGHTS, S. C., Stafford Insulation Co.
 CHICAGO, Culberg Asbestos & Cork Co.
 E. C. Carlson Co.
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 CLEVELAND, The Miles Materials Co.
 COLUMBUS, Santeier Brothers
 CORPUS CHRISTI, Precision Insulation Co.
 DALLAS, Insulation Supply Co., Inc.
 DAVENPORT, Republic Electric Co.
 DENVER, Gene Wright Lumber Co.
 DES MOINES, Iowa Asbestos Co., Inc.
 EL PASO, Insulation Specialists Co.
 EVANSVILLE, Ind., George Koch Sons, Inc.
 FT. SMITH, Ark., Gunn Distributing Co.
 FT. WAYNE, Ind., M. H. Hill, Inc.
 FT. WORTH, The Bracken Co.
 GREENSBORO, N. C., Starr Davis Co., Inc.
 GULFPORT, Miss., Paine Supply Co.
 HOUSTON, Precision Insulation Co.
 INDIANAPOLIS, Central Supply Co.
 JACKSON, Miss., Paine Refrigeration & Supply Co.
 JACKSONVILLE, Forber Sheet Metal Works
 JOPLIN, Mo., Joplin Cement Co.
 KANSAS CITY, Central Supply Co.
 LITTLE ROCK, Gunn Distributing Co.
 LOS ANGELES, Thorpe Insulation Co.
 Western Fibrous Glass Products Co.
 LOUISVILLE, General Insulation & Roofing Co.
 MEMPHIS, John A. Denie's Sons Co.
 MIAMI, Crabtree Insulation Co.
 Reynolds Aluminum Supply Co.
 Southern Metals Co.
 MILWAUKEE, F. R. Dengel Co.
 MINNEAPOLIS, Insulation Supply Corp.
 NASHVILLE, Reynolds Aluminum Supply Co.
 NEWARK, N.J., Eastern Steam Specialty Co.
 NEW HAVEN, Conn., Insulation Supply Co.
 NEW ORLEANS, Eagle Asbestos & Packing
 NEW YORK, Eastern Steam Specialty Co.
 NORFOLK, Va., C. E. Thurston Co.
 OKLAHOMA CITY, Ball Distributing & Engineering Co.
 OMAHA, Cardinal Supply & Mfg. Co.
 PHILADELPHIA, John F. Scanlan, Inc.
 PHOENIX, Ariz., Kircher Asbestos & Rubber Co.
 PITTSBURGH, Dravo Corp.
 RALEIGH, N.C., Reynolds Aluminum Supply Co.
 RAPID CITY, S. D., Robbins & Stearns Wholesale
 RICHMOND, Va., Reynolds Aluminum Supply Co.
 ROANOKE, Va., C. E. Thurston Co.
 ROCKFORD, Ill., Mott Brothers Co.
 SALT LAKE CITY, Bullough Asbestos Supply Co.
 SAN ANTONIO, The Bracken Co.
 SAN DIEGO, Western Fibrous Glass Products
 SAN FRANCISCO, Western Fibrous Glass Products
 SAVANNAH, Ga., Reynolds Aluminum Supply Co.
 SEATTLE, Western Fibrous Glass Products
 ST. LOUIS, Hollander & Co., Inc.
 The Stovey Company, Inc.
 ST. PAUL, Insulation Supply Corp.
 SULLIVAN, Ill., Lewie David, Inc.
 TALLAHASSEE, Fla., Bakers, Inc.
 TAMPA, Fla., Eagle Roofing & Art Metal Works, Inc.
 TULSA, Okla., Ball Distributing & Engr. Co.
 TUPELO, Miss., Paine Supply Co.
 VANCOUVER, B. C., Fleck Brothers Limited
 WASHINGTON, D. C., Walter E. Campbell Co.
 WICHITA, General Metals, Inc.



IDEAS

Carbon plant keeps up with aluminum output at Canadian smelter

Makes carbon for furnace anodes and lining

Aluminum production capacity of 80,000 tons per year will soon be realized at the Baie Comeau plant of the Canadian British Aluminum Company. Located on the north shore of the lower St. Lawrence River, the big installation is a subsidiary of the British Aluminum Company Ltd., and was formed in partnership with the Quebec North Shore Paper Company.

First stage of the aluminum smelter has been completed and work on second stage should be finished by early spring of 1959. Later, work is expected to proceed on two final stages which will bring annual capacity to 160,000 tons.

The two furnace rooms for stage 1 are more than 1700 ft long with a rectifier house at one end and casting shop at other. Each furnace room has 84 furnaces of the vertical-stub Soderberg type, connected in series.

Carbon Production

The aluminum production process needs about half ton of carbon for every ton of metal produced. Carbon producing facility at Baie Comeau provides both carbon paste for anodes of furnaces and carbon mixture for lining furnaces. Anode paste annual production is 48,800 long tons, using two shifts. Pot lining mixture output is 2500 long tons per year.

Anode paste is made from calcined petroleum coke which, after suitable treatment, is mixed with pitch. The grist for making furnace lining material is similar to anode product, but is made with calcined anthracite instead of petroleum coke. Pitch for the binder is also softened with creosote. Finished paste is extruded in form of ribbon or bars.

For melting pitch, as well as obtaining required temper-



Save time! Save money!



Repair corroded concrete with Penntrowel

Surfacing Compounds

Badly corroded concrete and cement surfaces in your plant don't have to cost you long shut-downs and expensive contracting jobs. You can repair those damaged areas with new PENNTROWEL Surfacing Compounds.

PENNTROWEL is tough. Its impermeable, corrosion-resistant coating turns away acids, alkalis, solvents... gives long service... doesn't crack or slough off.

PENNTROWEL is easy to use. You mix it right at jobsite, then just trowel it on... need no expensive equipment to mix and apply.

PENNTROWEL cures fast. Apply in afternoon, use surface next day!

PENNTROWEL is economical. Materials and surface preparation costs are amazingly low. And PENNTROWEL reduces future maintenance costs.

PENNTROWEL is available in three specialized grades... for corrosion protection, fluorine service and heavy wear. Write for descriptive folder and installation cost data.

Ask for a Demonstration We'll be glad to demonstrate PENNTROWEL's remarkable abilities to you right in your plant. Call or write today to arrange a test.



Corrosion Engineering Products Dept. 681
PENNSALT CHEMICALS CORPORATION
 Natrona, Pa.
 Penntrowel is a trade-mark of Pennsalt Chemicals Corp.

Check 3372 opposite last page

PHENOLINE



**protects concrete floors
against corrosion and traffic**

there's a PHENOLINE protective system for every plant requirement...with excellent acid, alkali, solvent resistance...fast curing.

1 SEVERE CORROSION • HEAVY TRAFFIC

For severe chemical conditions: splash, spillage, heavy chemical attack. Also for heavy foot and truck traffic. Non-skid properties. Long-wearing.

SYSTEM: Prime coat—Phenoline 300 Orange
Top coat—Phenoline 300

Total Thickness (trowel): 1/8 inch

2 SEVERE CORROSION • LIGHT TRAFFIC

For severe chemical conditions, but little trucking or other heavy traffic: e.g., beneath tanks and equipment.

SYSTEM: Prime coat—Phenoline 300 Orange
Intermediate coat—Phenoline 302
Top coat—Phenoline 300

Total Thickness (brush or spray): 1/2 inch

3 LIGHT CORROSION • LIGHT TRAFFIC

The economy coating for less severe conditions of corrosion and traffic. Non-skid properties. Easy to apply. Hard, tough protection.

SYSTEM: Prime coat—Phenoline 305 Primer
Top coat—Phenoline 305

Total Thickness (brush or spray): 25 mils

FREE . . . Sample panels of each system, on request. Write for complete details and recommendations for your service.

ANNOUNCING NEW PHENOLINE CONCRETE PRIMER for damp concrete which cannot be completely dried prior to application. Provides a tight bond for Phenoline top coats in all three systems.

SALES OFFICES:

Atlanta, Buffalo, Denver, Detroit, Houston, Los Angeles, Mobile, New York, Pittsburgh, San Francisco, Tampa, Tulsa, Toronto, other leading cities.

carboline
C O M P A N Y

32-B Hanley Industrial Ct.
St. Louis 17, Mo.

Specialists
in Corrosion-Resisting
Synthetic Materials

Check 3373 opposite last page

IDEAS

atures in processing vessels, tanks, and pipelines, Hydrotherm No. 500 heating fluid, manufactured by Monsanto Chemical Company, is used. Material can be pumped as a liquid up to 600°F in a non-pressurized system. Product is fire-resistant and is heated by heater with two burners, providing about 6 million Btu per hour.

Burners can be operated easily from heater, or from main control room, where all instrumentation is concentrated. Temperature control and safety control for furnace are fully automatic.

Heating system is divided into a low-temperature and high-temperature system. Latter is used for melting. Former is used for heating pipelines and mixers. High-temperature circuit is made up of freshly heated fluid. Low-temperature circuit contains heating fluid returning from jackets or coils of high-temperature circuit.

(Based on paper prepared by H. W. Bodlaender, Kennedy-Van Saun Mfg. & Engineering Corp., 2 Park Avenue, New York 17, New York, designers of plant.)

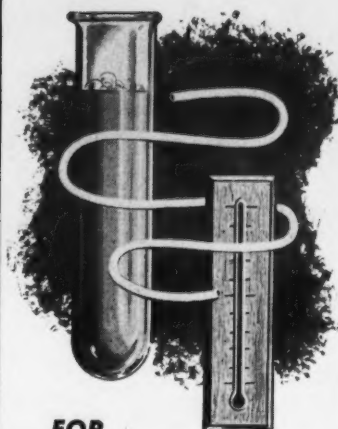
(Heating system and heat transfer fluid were furnished by American Hydrotherm Corporation, 10-55 Jackson Avenue, Long Island City 1, New York, New York.)

Check 3374 opposite last page.

(Further information about heat transfer fluids such as Hydrotherm No. 500 may be obtained from Organic Chemicals Division, Monsanto Chemical Company, St. Louis 1, Missouri.)

Check 3375 opposite last page.

Geneva atom papers presented by American nuclear scientists at conference on peaceful uses of atomic energy are listed in 16-page publication. Over 600 U.S. papers are offered covering such research areas as chemistry and chemical engineering, biological effects of radiation, fabrication of fuel elements, technological application of isotopes and other radiation sources, and many others. To obtain list of U.S. technical papers, remit 25c direct to Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C.



**FOR
HIGH TEMPERATURES
CORROSIVE STREAMS
FLEXIBLE APPLICATIONS**

USE



**FLEXIBLE
TUBING**

MADE FROM

TEFLON*

A unique combination of properties are available to you when you use PF flexible tubing made from Teflon*:

- widest service temperature of any plastic (-450°F to +500°F)
- complete chemical inertness
- flexibility and toughness even at the temperature of liquid oxygen
- lowest coefficient of friction of any solid material
- very low permeability
- available with flare, insert and ferrule type fittings

These properties, plus our carefully controlled extrusion techniques, make PF's flexible tubing made from Teflon* ideally suited for chemical, pharmaceutical, petroleum, hydraulic hose and similar applications requiring unique tubing properties.

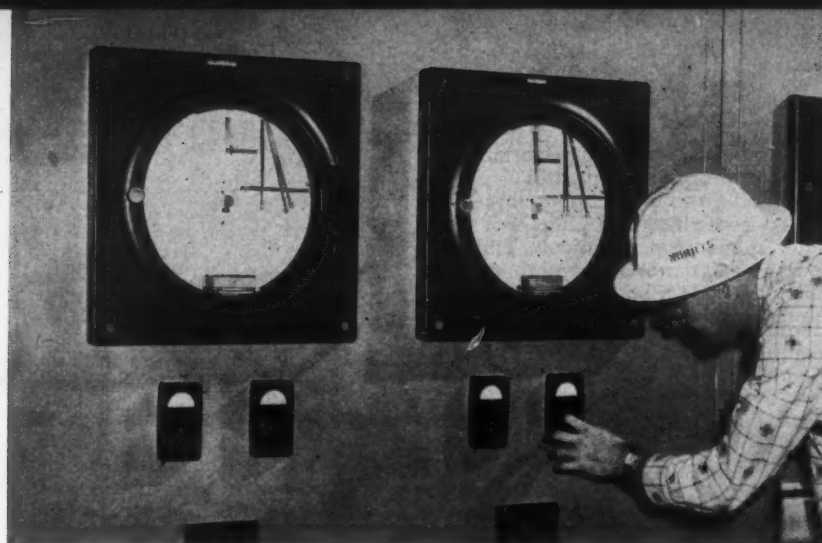
Write, wire or call for information on special sizes, wall thicknesses and colors and for PF heavy wall tubing, spaghetti and rod stock.

PENNSYLVANIA FLUOROCARBON CO., INC.

1113 N. 38th Street, Phila. 4, Pa. EVergreen 6-0603

*Teflon is a registered trade name for Tetrafluoroethylene resin.

Check 3376 opposite last page
CHEMICAL PROCESSING



**PROCESS INSTRUMENTATION
and LABORATORY APPARATUS**

Rate of flow, pressure, and temperature of hydrogen chloride gas to Du Pont and Goodrich plants are recorded at this point 2½ miles distant from the actual metering installation. Air-actuated valves are operated by electronic control stations below recorders

Adapting a control technique from the natural gas industry, engineers at Stauffer Chemical Company's chlorinated hydrocarbon plant installed an electro-pneumatic control system for distributing hydrogen chloride gas to two chemical plants . . . achieving dependable response and control with a relatively small investment

REMOTE METERING AND CONTROL SYSTEM

- SAVES \$40,000 COST OF A NEW PIPELINE
- PERMITS FLOW CONTROL FROM 2½ MILES DISTANT

CP Editorial Staff
with W. F. ALLAIRE
Plant Engineer
Stauffer Chemical Company
Louisville, Kentucky

PROBLEM: Excessive amounts of time and money for easements for a second pipeline to distribute anhydrous hydrogen chloride threatened to delay sale and delivery of additional product available from newly constructed chlorinated-hydrocarbon plant at Stauffer's Louisville installation.

Since completion of original

Engineer W. F. Allaire opens the block valve in HCl line supplying B. F. Goodrich's nearby polyvinyl chloride installation. Already supplying Du Pont, Stauffer split its line to supply Goodrich. This created a metering problem since point of splitting is 2½ miles from Stauffer's plant. An electro-pneumatic control system was the answer

chlorinated-hydrocarbon plant in 1954, by-product hydrogen chloride had been sold to nearby Du Pont neoprene works via a six-inch pipeline approximately 2½ miles long. As only one customer was involved, delivery of gas was controlled by operating rate of hydrocarbon plant, with me-

tering accomplished by a conventional pneumatic recording system located in the Stauffer plant.

With completion of a second hydrocarbon plant at Louisville, Stauffer had additional anhydrous hydrogen chloride available. A second customer, B. F. Goodrich Chemical Com-

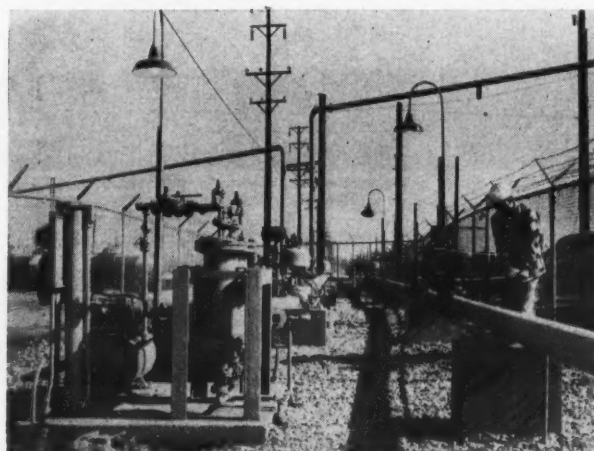
pany, was contacted for gas delivery. The Goodrich plant is located an additional 1½ miles beyond the Du Pont Works, making it a total of approximately four miles from the Stauffer plant.

Discussion with the individual consumers resulted in the decision that Stauffer would control distribution of gas in accordance with contract terms. Preliminary thinking was to erect a second pipeline from Stauffer to Goodrich, thus duplicating the single initial metering installation.

But preliminary investigations of the cost of a second pipeline and the time required to obtain easements for it indicated some other approach to the problem was desirable. Yet, contracts were to be signed and delivery would have to be made.

Solution: Adapting a technique from the natural gas field but which, it is believed,

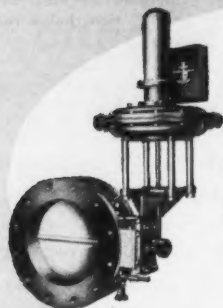
To page 110





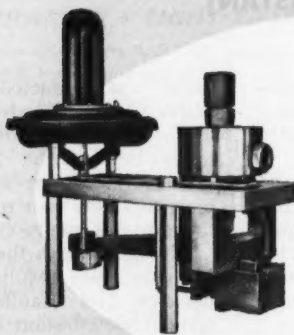
Needle Valves

Rugged, outstanding performers for proportional control of small flows. Interchangeable seat rings and plugs. For water, gas, steam, chemicals. Trim and body materials available for "difficult" fluids. Shown here with unique reversible Stabilflo Motor.



Butterfly Valves

Light and heavy duty types, with angle or swing-through seating, in spool or wafer body style, for low pressure air, gases in combustion control, steam, high pressure gases and liquids, etc. Available with Stabilflo Motor (shown) or cylinder operator.



Super-Pressure Valves

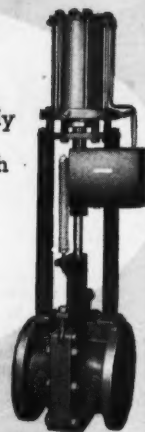
For throttling or let-down service up to 30,000 psi. Features an exclusive high-pressure bellows seal. Port sizes and connections to meet high pressure process specifications.

GET THE BEST



Saunders Type Valves

A complete line, particularly suited to handling of highly corrosive fluids, or fluids containing solids in suspension. Available with Stabilflo Motor as shown, or with Stabiload Cylinder and Power Positioner.



Gate Valves

Guillotine-type slide valves, specially designed to handle pulp fibre, slurries, and similar fluids. Available with Stabiload Cylinder and Power Positioner as illustrated, for throttling service, or with 4-way pilot valve for on-off service.

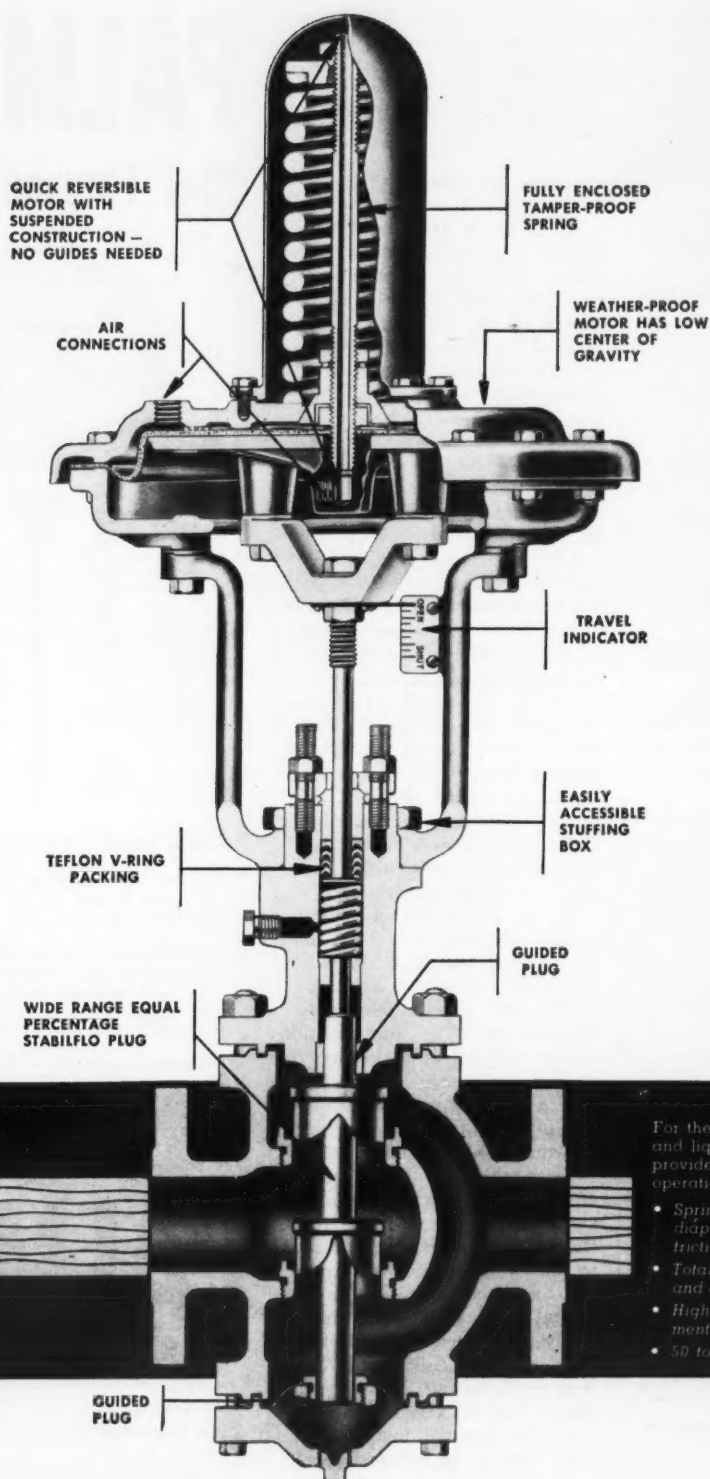
FOXBORO CONTROL VALVES

Reg. U.S. Pat. Off.

10 Strategic Branch Shops for Coast-to-Coast Service: Atlanta, Ga. • Pittsburgh, Pa. • Chicago (Skokie), Ill. • Dallas, Tex. • Houston, Tex. • Corpus Christi, Tex. • San Francisco (San Leandro), Cal. • Los Angeles, Cal. • Montreal, Que. • Vancouver, B. C.

SOLUTION TO YOUR CONTROL VALVE PROBLEMS

...with Foxboro Pneumatic Control Valves



You can always be sure of getting the control valve best suited to flow conditions and control actions when you specify Foxboro. No other single source offers such a wide variety of control valves for specific applications. None other has Foxboro's experience in applying them — in every phase of industrial processing.

Your choice extends from valves for simple on-off control at one extreme, to specialized proportioning control at the other; for high vacuum work to operation at 30,000 psi; for temperatures from -350° to $+1000^{\circ}\text{F}$. And there's a wide choice of plug designs — and of alloys and trim to handle even severely corrosive and erosive fluids.

You can save shipping cost and time, too, buying direct from Foxboro's strategically located branch shops. They're staffed by experts.

A few typical control valves from Foxboro's complete line are illustrated here. For full details, or specific information on your problem, call your nearby Foxboro Field Engineer or write The Foxboro Company, 811 Neponset Ave., Foxboro, Mass.

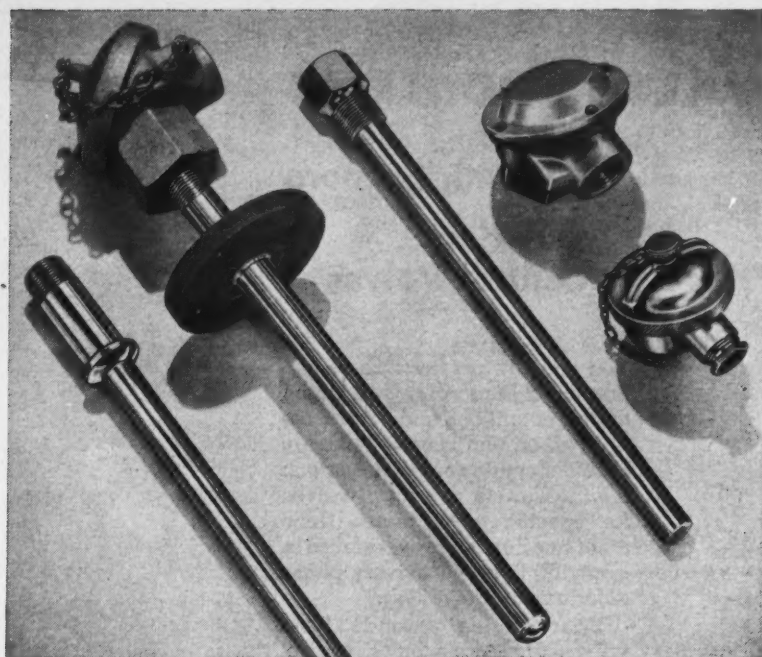
STABILFLO CONTROL VALVES

For the great majority of temperature, pressure, flow, and liquid level control applications, this basic valve provides unsurpassed sensitivity and troublefree operation. Unique design features:

- Spring above diaphragm construction makes diaphragm motor self-aligning, virtually free from friction and hysteresis.
- Totally enclosed spring protects against tampering and corrosion.
- High lift wide range V port provides greater increment of lift for given change in air pressure.
- 50 to 1 rangeability — equal percentage characteristics.

For more information on product at left, specify 3377 see information request blank opposite last page.





Thermocouple Assemblies For Every Industrial Use

Thermo Electric's base metal thermocouple assemblies give consistently reliable temperature readings for ranges between -300°F. and $+2200^{\circ}\text{F.}$ We specialize in solving problems caused by chemical attack, pressure and installation difficulties . . . and offer the most complete variety of standard thermocouple assemblies in the industry. See our new 16 page catalog for the many types available.

Thermocouples

Single and multiple junction thermocouples are made of all standard thermocouple materials and gage sizes. Ceramic insulated, metal sheathed "Ceramocouples" are used most effectively for extended life at high temperatures or for sub-zero conditions where condensation is a problem. These temperature sensing elements have excellent resistance to moisture, petroleum products, chemical action and abrasion, and are often used without additional protection tubes. The wires used in all these thermocouples are drawn, annealed, insulated and calibrated in our own wire mill under Thermo Electric's high standards for mechanical and thermoelectric qualities.

Thermowells

The selection of over 5700 standard Thermowells includes bar stock or built-up construction, test wells and extra sensitive wells; and a variety of mounting fittings and flanges. Many construction materials available—all wells are pressure tested.

Connection Heads

Choose from six different types, including heavy duty cast iron heads, lightweight aluminum heads, and quick-opening heads. All weather proof—many sizes.

Write For New Catalog E-R

Our Thermocouple Catalog has complete information, simplified ordering instructions for all assemblies and components, and a Thermowell Material Guide for hundreds of industrial applications.

**Thermo
Electric** CO., INC.
SADDLE BROOK, NEW JERSEY

In Canada: THERMO ELECTRIC (Canada) LTD., Brampton, Ont.

Check 3378 opposite last page

INSTRUMENTS & LAB

From page 107

has not yet been applied in the chemical industry, engineers at Stauffer designed an electro-pneumatic control system for remote control of gas flow through the pipeline. Use of the system was based on fact the original pipeline could handle the additional gas flow, eliminating need for a second pipeline for a portion of the distance.

Here's the Control System

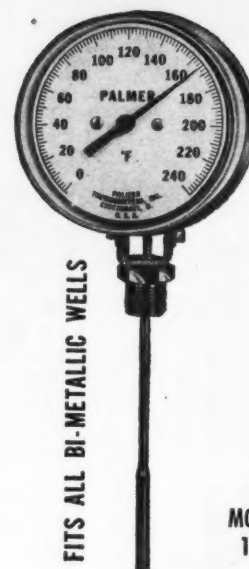
Metering station was installed close to the Du Pont plant, $2\frac{1}{2}$ miles from Stauffer's installation, at point where gas line is split for gas flow to each consumer's plant. Differential pressure across an orifice plate in each gas line, along with gas temperature and pressure in each line, is measured continuously and relayed to the Stauffer plant, where control panel is located, by electronic transmitters.

The individual electronic signals, ranging from 0.5 to 5.0 ma at 6 volts DC, are transmitted from the meter station to the Stauffer plant by conventional telephone cable provided by the local telephone company. Approximately 1800 feet of new cable was installed. Remainder of $2\frac{1}{2}$ -mile distance is handled through existing 256-pair telephone cable. The signal enters the plant through the same cable used for plant telephone system.

At the plant, the electronic signals ranging from 0.5-5 ma are converted to standard pneumatic signals of 3-15 psig range by electro-pneumatic transducers. The pneumatic signals are fed to a three-pen recorder for each customer, where a continuous daily record of flow, temperature, and pressure is recorded.

To enable Stauffer control of flow to each customer, the electronic flow signals from the meter station are also fed to individual master electronic control units. Here the individual signals are automatically compared to a desired flow setting. Any deviations from the desired setting produces an electronic output from the control instruments. This signal is relayed back

Outstanding Accuracy **PALMER** Dial Thermometer



MODEL
1035

Check these functional features

- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

PALMER
THERMOMETERS, INC.

Mfrs. of Industrial Laboratory,
Recording and Dial Thermometers
2501 Norwood Ave., Cincinnati 12, O.

Check 3379 opposite last page

CHEMICAL PROCESSING

through a separate wire in the telephone cable to the meter station.

Individual field-mounted transducers at the meter station convert the electronic signals to pneumatic output which actuates pneumatic flow control valves in each customer's gas line. Provisions are made in the electronic master control units to enable manual as well as automatic flow adjustments to each customer. A small air compressor at the meter station, with accompanying air dryers and pressure regulators, provides air for pneumatic control valves.

Results: The electro-pneumatic system was completed in May 1957. Although a system of this type was mandatory because of easement difficulties, it is estimated that approximately \$40,000 was saved by installation of this system as compared with installation of a second pipeline. This saving does not include easement costs which would further increase the savings.

The system has permitted flow control from a point 2½ miles distant with dependable fast response . . . and yet the investment has been relatively small.

(Domotor pneumatic control valve is product of Annin Company, division of Annin Corporation, 1040 S. Vail Ave., Montebello, Calif.)

Check 3380 opposite last page.

(American-Microsen electronic controls are products of Industrial Controls Division, Manning, Maxwell & Moore, Inc., Danbury, Conn.)

Check 3381 opposite last page.

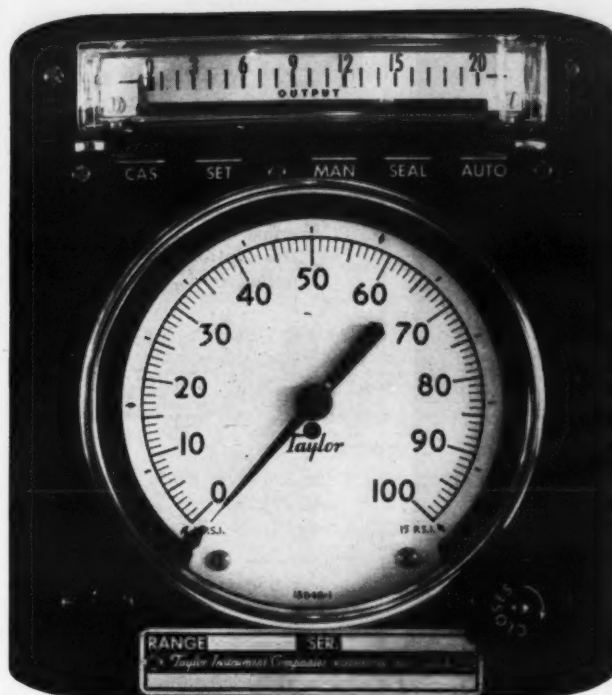
(Recording flow meter is product of Republic Flow Meters Co., subs. of Rockwell Manufacturing Company, 2240 Diversey Pkwy., Chicago 47, Illinois.)

Check 3382 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

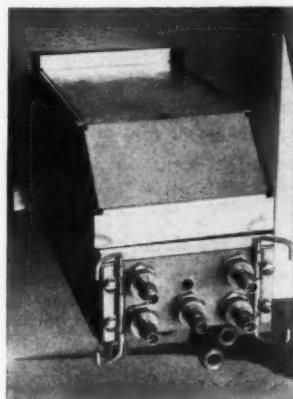
Taylor announces a new low cost

TRANSET* INDICATOR



FOR MOST ECONOMICAL INDICATION AND CONTROL

Team up the new 82KF Series TRANSET Indicator with the SENSARE* Temperature Transmitter or the No. 200T Fixed Range Differential Pressure Transmitter.



Rear view, showing plug-in facilities for TRANSCOPE, TRISCOPE or TRANSET controllers.



Indicator gage snaps in for easy removal without disturbing piping or process control.

This latest addition to the TRANSET family of instruments is designed to permit plug-in mounting of either the bellows type TRANSCOPE*, TRISCOPE* or stacked diaphragm type TRANSET Controllers.

Using accurate, time-proven components, it has exceptionally stable and driftfree set point adjustment. Choice of Bourdon or high accuracy Niafram elements, according to process requirements.

Same cutout as the 66K and 86J TRANSET Indicators and Recorders, and can be quickly adapted to fit the TRANSCOPE Recorder cutout.

Maintenance and servicing is particularly easy. The snap-in indicator gage can be removed for checking without disturbing piping or process control.

Precision adjusting of set point, with regulator having metallic feed-back element and Ni-Span spring, insures stable output even with wide temperature variations.

Piston type selector valves with "O"-ring seals give leakless transfer. Positive positioning is assured by lever switching with definite mechanical stops.

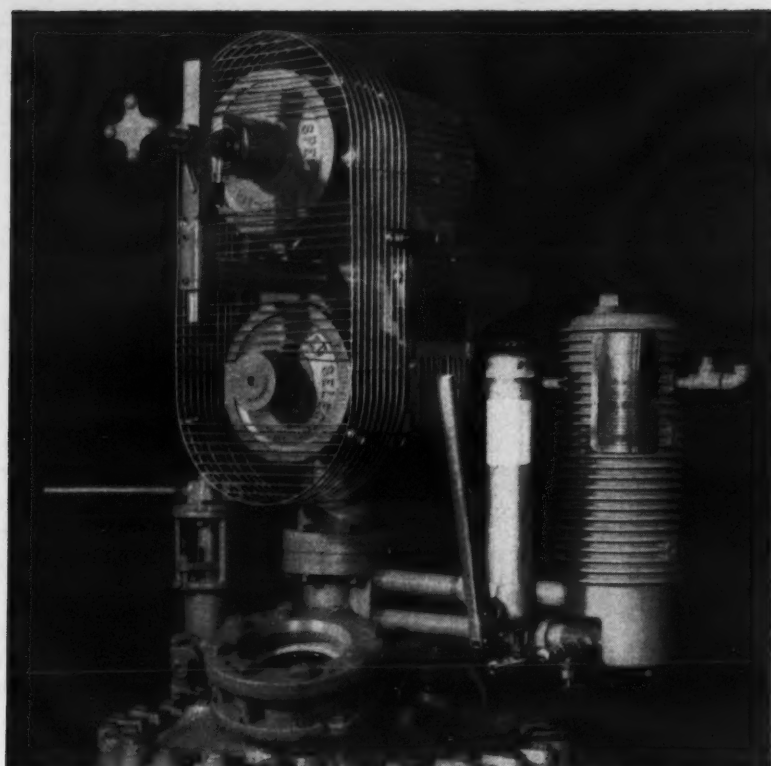
Set point transmitter and switching blocks are the same as used in the famous TRANSCOPE Recorder.

For full details of this precision built but inexpensive instrument see your Taylor Field Engineer or write for information to Taylor Instrument Companies, Rochester, New York or Toronto, Ontario.

*Trade-Mark

Taylor Instruments MEAN ACCURACY FIRST

Check 3383 opposite last page



Neat compact W Drive packs a lot of power at low cost

Here's a compact, inexpensive drive that delivers up to 10 horsepower.

It's pedestal mounted so you'll find it readily adaptable to any tank, even including open vessels. It normally has a Glasteel impeller, so it's ideal for work with all corrosives. Alloy impellers and turbines also available.

Carries heavier loads. Both gear and pinion are throated, a design which gives maximum contact area to teeth—much more than with other worm drives. This translates into heavier load capacity.

Requires little attention. Maintenance on the W Drive consists almost entirely of periodic lubrication and an occasional check of alignment.

Many modifications. Use stuffing box or mechanical seal. Fixed

SPEED RANGE WITH VARIABLE SPEED SHEAVES

Drive Ratio	2.5W		3W	
	HP at Max. Speed	Agit. RPM Range	HP at Max. Speed	Agit. RPM Range
5:1	2	600 to 128	3	600 to 128
10:1	2	300 to 64	3	300 to 64
20:1	2	150 to 33	3	150 to 33
30:1	1.5	100 to 22	2	100 to 22

Note: There are 4W and 5W drives which deliver 7.5 and 10 HP respectively in comparable speed ranges.

speed or variable speed sheaves are standard. You can specify hydraulic, explosion-proof design. Or, double reduction gearing and flange-mounted motor.

For more details on the W Drive, send for Bulletin 965.



THE PFAUDLER CO.

a division of PFAUDLER PERMUTIT INC. • Rochester 3, New York

Check 3384 opposite last page

INSTRUMENTS & LAB

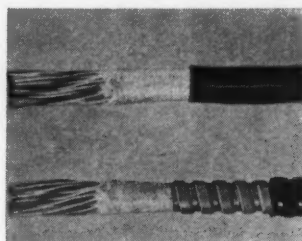
Thermocouple extension wire bundles have steel sheath

Bundles are designed for fast installation

Uses: As thermocouple extension wire bundles.

Features: Thermocouple bundles have either steel or plastic sheaths, are designed for fast installation.

Description: Bundles are supplied in two styles: one is



Plastic or steel armor protects thermocouple wire bundles

covered by a vinyl plastic over a braided untreated cotton jacket. Another has a galvanized steel armor of modified square-lock construction over a cotton-covered bundle. Steel armor is then covered with corrosion-resistant plastic sheath. Bundles can be supplied for Iron-Constantan, Chromel-Alumel and Copper-Constantan thermocouples.

(Thermocouple extension wire bundles are product of Dekoron Products Div., Samuel Moore & Co., Mantua, Ohio.)

Check 3385 opposite last page.

Glassware drying oven boosts turn-over

Has stainless steel interior, controlled heat

Uses: As glass drying oven to boost drying speed of laboratory glassware.

Features: Drying oven has stainless steel interior, controlled heat to 360°F.

Description: Cabinet-style drying oven is floor mounted with working chamber finished entirely of 18-8 stainless steel. Exhaust gases and vapors are exhausted by built-in

four inch vent. Exterior is treated for rust prevention and finished in smooth baked-on chip-proof enamel. Instruments are recessed and center-mounted to permit placement of unit flush with other equipment.

(Glassware drying oven is product of The Electric Hot-pack Co., Inc., Cottman Ave. & Melrose St., Philadelphia 35, Pennsylvania.)

Check 3386 opposite last page.

Plastic solenoid valve resists corrosion

Fluid does not contact metal at any time

Uses: As corrosion-resistant plastic solenoid valve.

Features: Valve is so designed that as fluid flows through valve, it does not encounter metal at any point.

Description: Valve has 2-way NC molded nylon body.



All plastic valve resists corrosion

Plastic diaphragm seal permits positive bubble-tight sealing. Valve may be taken apart for cleaning and inspection without removal from line.

Valve is designed for 115V AC power. Fittings are designed for 3/8" ID slip-on plastic tubing.

(SV-5100-1 plastic valve is product of Valcor Engineering Corp., 365 Carnegie Ave., Kenilworth, N.J.)

Check 3387 opposite last page.

**Rugged metal rotameter
for hazardous liquids**

Is designed for high pressure fluids

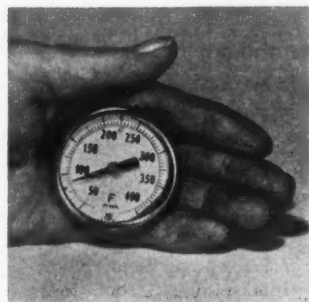
Uses: In flow measurement jobs with hard-to-handle fluids under hazardous and high pressure conditions.

Features: Metal tube rotameter is so designed as to permit fluid to contact only metal metering tube, metal extension tube, and metering float.

Description: Operating at temperatures up to 400°F, rotameter is stainless steel wherever it comes in contact with fluid. It can be constructed of carbon steel, Hastelloy, or other special materials. Teflon coating on magnet provides protection. Sizes available cover capacity ranges of 0.24 gpm to 2.4 gpm for the smallest and 10 gpm to 100 gpm for largest.

(Fig 1900-F metal tube rotameters are product of Schutte & Koerting Co., Cornwells Heights, Bucks Co., Pa.)

Check 3388 opposite last page.

**Dial thermometer . . .**

. . . with 2" dial has case, ring, and stem of 18-8 stainless steel. Bi-metal instrument has been designed to provide mounting convenience without sacrificing visibility. Instrument may be installed either indoors or out. Standard ranges are from -80/120°F and 200/1000°F.

("American" thermometer is product of Manning, Maxwell & Moore, Inc., Stratford, Conn.)

Check 3389 opposite last page.

"Hand size" control valve for all corrosive applications

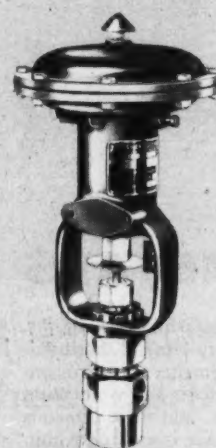
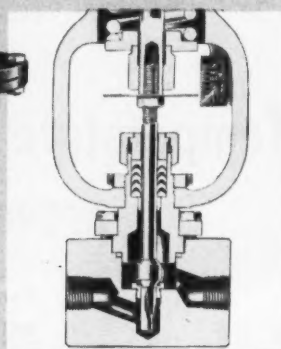
► **Inexpensive and highly dependable.**

► **Available in globe or angle body single port construction.**

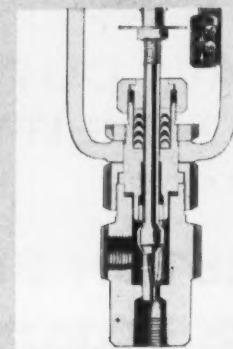
Fisher now offers the low cost, dependable "BA" angle body and the "B" globe body valves for use on heavy duty applications involving corrosive liquids. Bodies are machined from 316 stainless steel bar stock, or other alloys such as Monel or Hastelloy. Either body can be supplied with Type 510 spring open or Type 511 spring closed diaphragm actuator. Normal diaphragm range 3 to 15 psi.



Type 510-B valve with globe body and bolted bonnet construction.



Type 511-BA valve with angle body and a union nut bonnet.

**CONSTRUCTION AND SPECIFICATIONS**

Valve Body Sizes	$\frac{1}{2}$ ", $\frac{3}{4}$ " and 1" only with screwed end connections.
Inner Valve	Micro-flute or Micro-form.
Orifice Sizes	$\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ " for the 1" size body. $\frac{1}{4}$ ", $\frac{3}{8}$ " and $\frac{1}{2}$ " for the $\frac{3}{4}$ " size body. $\frac{1}{4}$ " and $\frac{3}{8}$ " for the $\frac{1}{2}$ " size body.
Max. Body Pressure	1500 psi at 450° F.
Overall Dimension	Approximately 15" with the Type 510 or Type 511 topwork on either a "B" or "BA" body.



IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD . . . CHANCES ARE IT'S CONTROLLED BY . . .

FISHER GOVERNOR COMPANY

Marshalltown, Iowa / Woodstock, Ontario / London, England

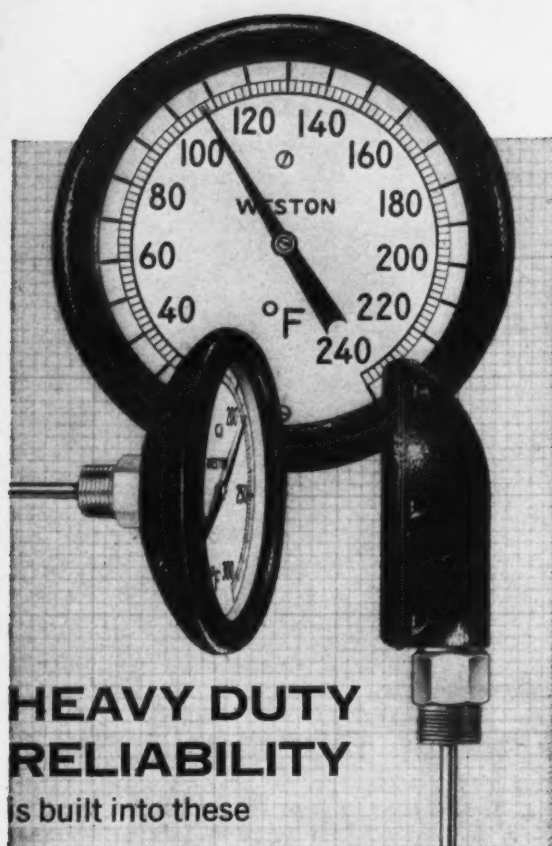
CONTINENTAL EQUIPMENT CO. DIVISION, Coraopolis, Pennsylvania



For complete information
write for Bulletin 57 B.

Check 3390 opposite last page

WESTON THERMOMETERS: STANDARDS OF STABILITY IN SCIENCE AND INDUSTRY



**HEAVY DUTY
RELIABILITY**
is built into these

WESTON BIMETALS

For lasting accuracy, even under punishing conditions, you can depend on Weston heavy duty bimetal thermometers. Exceptionally stable sensitive elements . . . corrosion-proof, pressure-tested stainless steel stems and connection nuts . . . rugged forged brass heads . . . suit these bimetals for the most strenuous service. Accuracy is assured within 1% of full scale range. 20 standard ranges: running from -100° to 1000°F or -100° to 400°C . Standard stem lengths from $2\frac{1}{2}''$ to $72''$.

Model 2221: has a 5" diameter head with 9" scale.

Model 2231: 6" diameter head with 12" scale.

Model 1221: straight form—basically the same as Model 2221, but with scale parallel to stem. Stem can be located in any one of 24 positions around the periphery of the head.

For full information, call your local Weston representative, or write to Weston Instruments, Division of Daystrom, Inc., Newark 12, N. J. In Canada: Daystrom Ltd., 840 Caledonia Rd., Toronto 10, Ont. Export: Daystrom Int'l., 100 Empire St., Newark 12, N. J.

WESTON

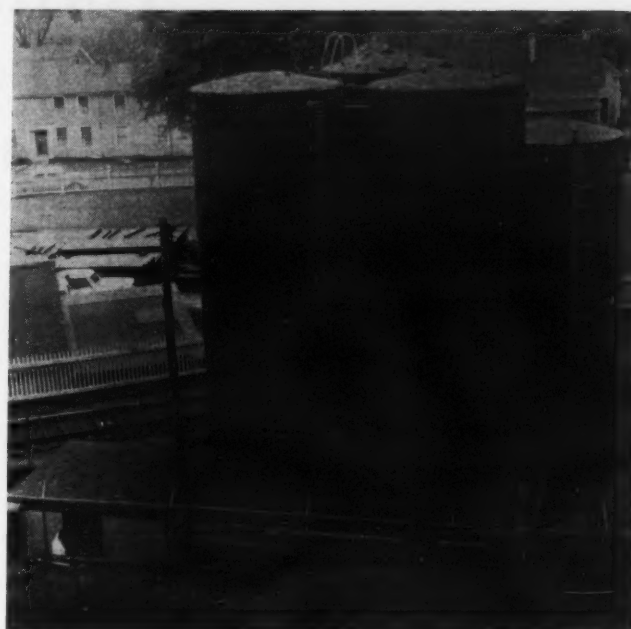


Instruments

Check 3391 opposite last page

PROCESS INSTRUMENTATION and LABORATORY APPARATUS

Pump house for recirculating systems is dwarfed by four wax storage tanks at Nashua Corporation. Length of insulated lines emanating from tank at far right indicates problem of getting tank back into service should line become plugged with wax



Temperature monitoring prevents line freeze-ups

**Remote alarm system saves installing
extra pumping equipment for fluid wax**



Continuous check on wax temperature in all four tanks is maintained by four-station thermistor controller. When temperature in any tank falls below preset reading, alarm sounds in boiler house

Problem: Curtailment or stoppage of departmental operations posed a winter-long threat to the Nashua Corporation, Nashua, N. H., if freeze-ups occurred in outdoor pump intake lines from four tanks containing liquefied wax.

Line freezing would take two men, working full time, three to five days to restore to service just one of the tanks. Three contain paraffin wax which solidifies at 145°F ; the fourth contains special blending wax which solidifies at 165°F . Wax is used to manufacture wax-coated papers for bread papers, frozen food packages and other food items requiring a moisture-tight, non-toxic wrapper.

There also was the possibility of wax congealing in lines and forming a solid plug. This situation could result if wax flowing from tanks was too cool or if lines were incompletely drained during routine or emergency shut-downs. If this happened, insulation would have to be

To page 116

THAT'S INTERESTING

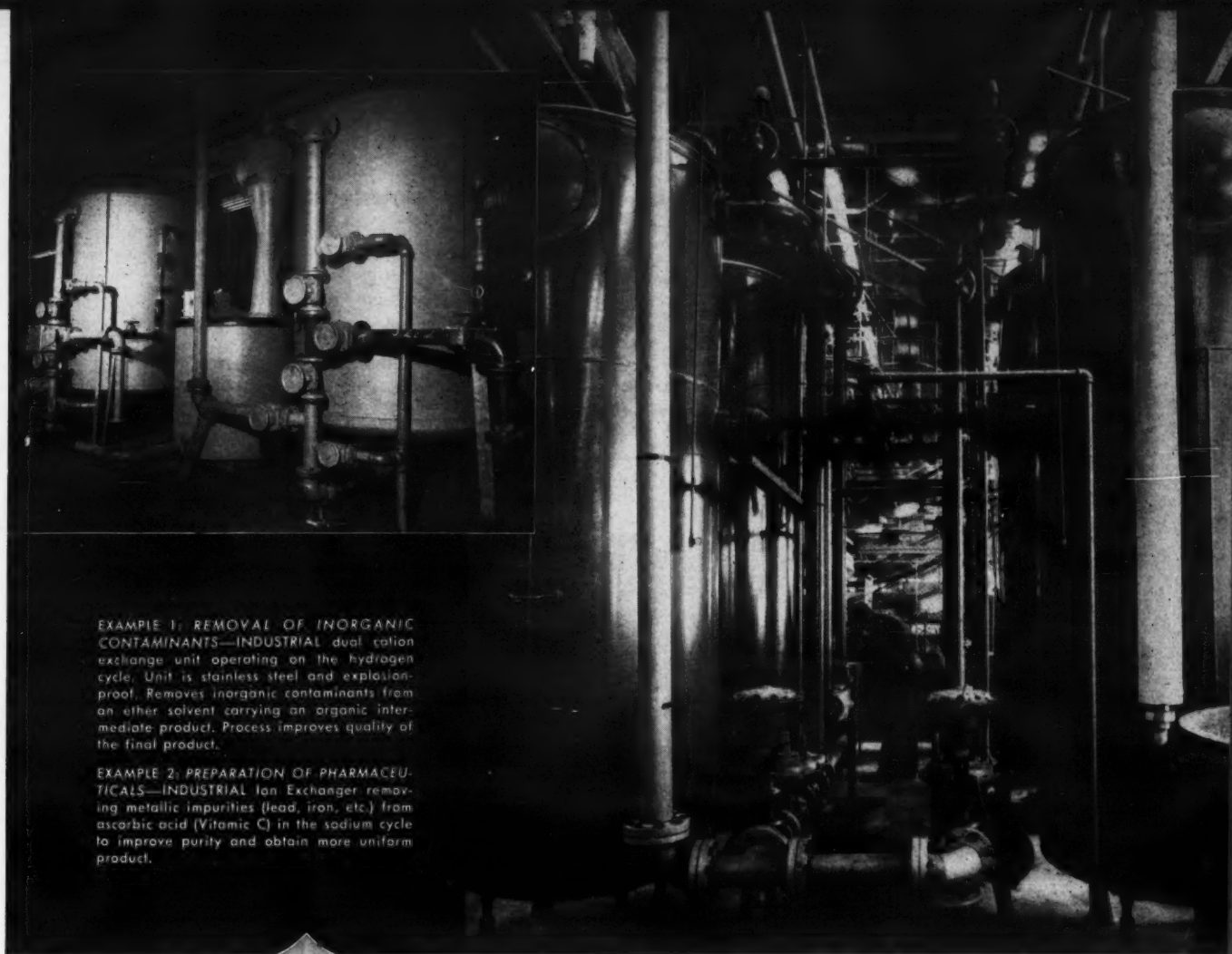
Did it ever dawn on you

We usually think of dawn as the beginning of a new day, but it's not really, except in certain countries. The day begins at sunset with the Jews, Athenians, Chinese, Mohammedans, Italians, and Bohemians; at sunrise with the Babylonians, Syrians, Persians, and modern Greeks; at noon with ancient Egyptians and modern astronomers; at midnight with the English, French, Dutch, German, Portuguese, and Americans. (Gentry Sere-nader, Gentry)

Widest sheet of steel

A high-strength steel sheet 160" wide was produced by Lukens Steel Company by the "pack-rolling method" for use in rocket motors using solid fuels. Pack-rolled wide sheet was produced on 206" plate mill, said to be largest in the nation.

For more information on product at right, specify 3392 see information request blank opposite last page.



EXAMPLE 1: REMOVAL OF INORGANIC CONTAMINANTS—INDUSTRIAL dual column exchange unit operating on the hydrogen cycle. Unit is stainless steel and explosion-proof. Removes inorganic contaminants from an ether solvent carrying an organic intermediate product. Process improves quality of the final product.

EXAMPLE 2: PREPARATION OF PHARMACEUTICALS—INDUSTRIAL Ion Exchanger removing metallic impurities (lead, iron, etc.) from ascorbic acid (Vitamin C) in the sodium cycle to improve purity and obtain more uniform product.

INDUSTRIAL

ION EXCHANGERS

**meet highest purity standards
for continuous processes**

Every day INDUSTRIAL Ion Exchangers are *replacing* expensive, complicated processing equipment in the purification of literally hundreds of chemical products. Why? Because INDUSTRIAL has successfully adapted the newest developments in ion exchange research to simple techniques. This new equipment provides advantages like these: **NO HOLD-UP TIME . . . LOWER CAPITAL INVESTMENT . . . LOWER OPERATING COSTS . . . PLUS—PURITY STANDARDS TO MEET VIRTUALLY ALL REQUIREMENTS!**

The operating simplicity of these new techniques permits immediate integration of an INDUSTRIAL Ion Exchanger in almost any continuous chemical process. The views on this page show some current specialized applications.

Investigate how INDUSTRIAL Ion Exchange equipment can solve your purifying problems at lower costs. Call or write today for details covering an analytical economics study.

INDUSTRIAL

C-258

INDUSTRIAL FILTER & PUMP MFG. CO.

5908 Ogden Avenue, Chicago 50, Illinois

PRESSURE FILTERS ♦ ION & HEAT EXCHANGERS ♦ WASTE-TREATING EQUIPMENT

NEW... from K&M

EXTERNAL PILOT-OPERATED PRESSURE REGULATOR fast-acting, accurate . . . tight shut-off even on dead-end service

Examine it yourself . . . feature for feature. K&M has made a vast improvement in external pilot-operated pressure regulators.

It simplifies installations: *requires one less pipe*

line. It offers lowest maintenance: the result of good hydraulic and mechanical design throughout. It gives excellent performance: try one and compare with any other regulator of its type.

CLEANLY CONTOURED INTERIOR
has no spider, practically no flow restrictions . . . gives greater flow capacity . . . usually permits economy of smaller size

BLIND FLANGES
on both main valve and pilot allow easy access for routine maintenance

BUILT-IN STRAINER
protects pilot from scale, dirt, other foreign matter, is removable for cleaning

INTEGRAL BLEED ORIFICE
eliminates need for installation of extra bleed line

PRESSURE-ADJUSTING SCREW
permits convenient external pressure setting

GUIDE PISTON
has balancing grooves which hydraulically center guide, prevent binding and side-thrust

CONTROL SPRING
is isolated from main flow stream for greatest protection

If you would like a more detailed, close-up look at K & M's new Type 471 External Pilot Pressure Regulator, send for Bulletin 471A.



K&M

diaphragm control valves

Our 79th Year

KIELEY & MUELLER, INCORPORATED

Oldest Pressure and Level Control Valve Manufacturer
64 Genung Street, Middletown, New York

Check 3393 opposite last page

INSTRUMENTS & LAB

From page 114

stripped off and lines heated with blow torches to melt the plug. Longer lines would have to be separated and steam-cleaned.

In addition, if the special wax supply were involved or the paraffin wax supply in the remaining tanks were low, overall plant operations could be affected.

Solution: To help avoid line freezing or plugging, company installed a four-point thermistor controller to monitor wax temperature at base of each tank. Installation was made without disrupting normal operations. The 80 to 100 ft leads from the four probes are wired to control panel in pump house adjacent to tanks.

Should temperature of wax in any tank fall below preset reading (155°F for paraffin and 175°F for special wax), controller sets off alarm in boiler house to alert maintenance department. Alarm temperature is set about 10° above solidification point of wax to provide ample time to locate difficulty and remedy it. Operator can quickly ascertain where trouble is by checking tank temperatures on indicator on control panel, using selector switch to read out each point successively.

Controller does not use a standard cell or require reference junction temperature. Therefore, it is unaffected by ambient conditions in hot-wax pump house where air temperatures may vary from 100° to 140°F depending on the season.

Special lead wire is unnecessary; the probe leads can be ordinary electrical conductor (bell wire is used in this installation) without affecting sensing accuracy and without risk of inducing electrical interference from nearby power lines. Thermistor elements themselves, which are temperature-sensitive semiconductor materials, do not age appreciably, thus making them highly stable in continuous service.

Probes were lowered through tops of each tank into liquefied wax since it would have been impossible to install them through tank walls without

ELECTRONICS-TIME

Lumenite

AUTOMATIC CONTROLS

- ELECTRONIC LIQUID LEVEL
- INDUSTRIAL TIMERS
- TIME SWITCHES
- MAGNETIC SWITCHES
- ELECTRONIC SWITCHES

For Complete Information and Prices on Equipment Needed
Write For Any Bulletin Listed Below.

LT—Time Switches	FL—Liquid Level	ITC—Ice Thickness
PC—Program Clocks	FM—Milk Level	BH—Boiler Level
CR—Cycle Repeaters	FN—Nonconductive Liquid	MV—Motorized Sanitary Valves
R—Time Delay Relay	RMC—Automatic Reset	IT—Interval Timers
LAS—Auto-Lawn Sprinklers	LEE—Photo-electronic Relays-Counters, Etc.	

LUMENITE ELECTRONIC CO.

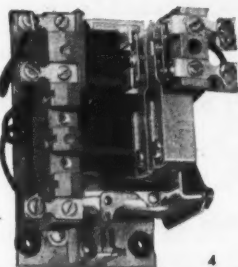
ENGINEERS • DESIGNERS • MANUFACTURERS

407 South Dearborn Street Chicago 5, Illinois

Check 3394 opposite last page



All Electric FLOATLESS LIQUID LEVEL CONTROLS



The original—pioneered by B/W in 1933. No floats! No moving parts in liquid. Literature describes relays and starters, automatic starter and relay combinations, multiple pump controls, special controls and panels and many application diagrams.

Controls not affected by pressures, temperatures, acids or caustics. Remote control if desired. Ice free electrodes where necessary.

WRITE FOR CATALOG

B/W CONTROLLER CORPORATION

2204 E. Maple Road, Birmingham, Mich.

Check 3395 opposite last page

INSTRUMENTS & LAB

draining off wax. Each probe is supported on a chain which reaches to within a few feet of tank bottom, where temperature is most critical and where probe will always be immersed.

System is a packaged four-station version of a control concept based on modular unit controllers. There is a master power supply chassis which contains one plug-in control unit for each point to be monitored or controlled. Desired control or alarm action can be set independently for each unit. Up to 100 points can be handled on control panel.

Results: Not only were potential maintenance and production problems caused by plugged lines eliminated, but temperature monitoring system saved installation of extra pumping capacity. This \$2000 addition would have been necessary to service a special wax storage tank which at that time was in the planning stage.

Each of the three existing tanks was served by a separate 100 gpm pump and recirculating system. A second level on the pump house was indicated because there was no space for additional pumping equipment in the pump house.

Monitoring system made it possible for company engineers to install fourth tank without expanding pumping capacity. One of three existing pumps was reconnected for the special wax recirculating system, and other two were left to handle recirculation for the three paraffin wax tanks. Intake and delivery lines for these tanks were then manifolded so that available 200 gpm pumping capacity was shared among the three tanks.

With outlet temperatures of each tank being monitored continuously, company has advantage of quickly detecting trouble in circulation lines. In addition, it is deriving considerable benefit from manifolding. A low temperature near tank outlet, which might plug pump intake, can be detected before serious trouble develops.

If there is no mechanical failure, low tank temperatures

To bottom of page 120

Model 226*

For the precise
measurement of

FLOW
Liquid Level
Differential Pressure

LOW DIFFERENTIALS...
HIGH STATIC PRESSURE...

(0-40" W.C. to 0-400 psid)
(up to 6000 psig)

BARTON Differential Pressure Flow Meters provide critical information in research and development, and in the testing of jet and rocket engines and components, insuring successful missile and rocket performance. Here, among the complexities of test equipment, BARTON flow instruments offer a high degree of accuracy and dependability, plus simple application, maintenance and installation.

Model 226
INDICATORA 224 SERIES
INSTRUMENT

Available in other models
with 224 actuation;

- Indicators
- Transmitters
- Recorders
- Flow Switches

for further information
request Bulletin 224-1

BARTON INSTRUMENT CORPORATION

580 MONTEREY PASS ROAD, MONTEREY PARK, CALIFORNIA

Representation in principal cities in the U.S.A.
and all over the world.

Check 3396 opposite last page

DEKORON PROTECTO-PAC

Advantages of Dekoron all-plastic instrument tubing harness are now four-dimensional. You get, in addition to its inherent lower-cost installation . . . chemical . . . impact . . . fire resistance.

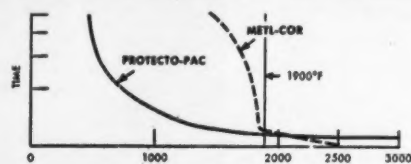
And the advantages of Dekoron Protecto-Pac multiply the closer you examine them. For example, you can get Protecto-Pac in many forms to suit your requirements exactly — from stock.

If there is danger from weld splatter, sparks or a potential fire hazard — order Dekoron Protecto-Pac Type FB. If you wish to bury it underground — specify low-cost Protecto-Pac Type B. Both types supplied with virtually any number of individual tubes, and also with new metal armor protection.

You can pay more but you can't buy better, longer-lasting instrument line harness than Dekoron — America's Premier Instrument Tubing Line.

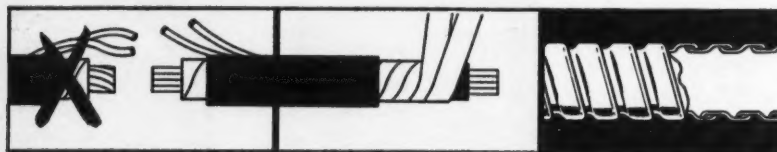
AA-3385

TYPE FB FOR FIRE AND IMPACT RESISTANCE



FIRE RESISTANCE
of copper tube bundles is superior up to 1900°F; less pronounced from 1900° to 2500°F. Above 2500° Protecto-Pac Type FB is superior to copper tube bundle.

TYPE B FOR UNDERGROUND BURIAL



NO "CORKSCREW" effect, as with twisted tubes, because tubes lie straight in bundle to give faster, neater individual tube take-offs.

NEW IMPROVED INSULATION is composed of two wraps of asbestos tape bonded to backing of Mylar® for maximum protection.

DEKORON PROTECTO-PAC Type FB or Type B can be supplied with 24 gauge galvanized steel armor of modified square-lock construction with cord packing for maximum strength and flexibility.



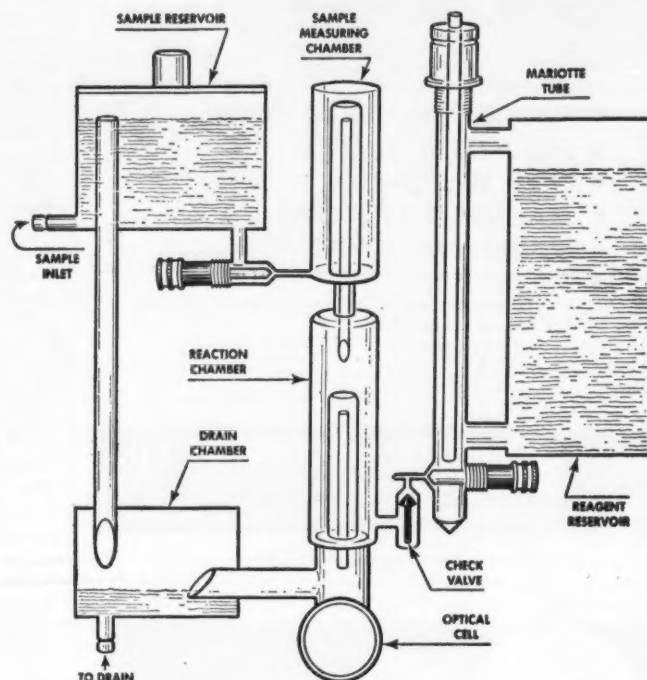
Dekoron products QUALITY • RESEARCH • SERVICE

SAMUEL MOORE & COMPANY • DEKORON PRODUCTS DIVISION • MANTUA, OHIO

Check 3397 opposite last page

PROCESS INSTRUMENTATION and LABORATORY APPARATUS

Simple and inexpensive makes automatic colorimetric



Developed in Belgium, automatic analyzer has no moving parts. It's powered entirely by gravity. Instrument can be hooked easily into process, for continuous sampling

Uses: Colorimetric analyzer monitors process streams for residual chlorine, pH, hardness, and phosphates. When equipped with photoelectric circuit, it provides visual, audial, or "off-on" control of chemical feeding.

Features: Simple and inexpensive for a colorimetric analyzer, instrument is powered entirely by gravity and requires no outside source of power. Trained operators are not necessary for running tests. Instrument can be adjusted to test a sample once every minute to once every fifteen minutes.

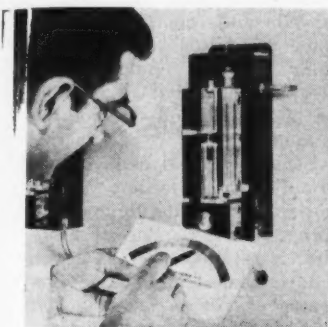
Description: Made entirely of clear acrylic plastic and costing less than \$350, analyzer has an accuracy adequate for normal plant sampling, ranging from two to five percent of reading. Instrument was developed in Belgium and brought to this country only recently, although work on unit has been in progress for the past six years.

How Does It Work?

Operating entirely by hydraulics, instrument requires no electric or pneumatic power. Sample and reagent are

analyzer analysis

Sample enters receiving chamber at top, which measures and discharges exactly 19 cc into reaction chamber below. Here the sample reacts with 3 cc of the reagent measured and supplied by the mariotte. Contents of reaction chamber are then discharged into optical cell, where results are observed



Operator can read ppm or take a reading by visually comparing graduations on a standard chart with sample in instrument's optical cell

volumetrically measured and fed to an optical chamber where the resulting color is read by eye and compared with color standards.

In conventional manual testing, operator takes sample from the process stream and carefully titrates it against a color standard. In this instrument, sample liquid enters a reservoir at top of unit, where an overflow tube maintains constant level. From the reservoir, sample then flows down by gravity through adjustable orifice to sample-metering chamber where it slowly rises to top of siphon tube. As soon as this point is reached, entire contents of metering chamber (19 cc) are discharged by siphon action to reaction chamber below. Flow rate through the adjustable orifice determines testing rate of instrument, can be regulated to run from four to

GLAS-COL

Heating Mantles assure safe, efficient heating of chemicals in oil refinery pilot plant



These Glas-Col flask and fractionating column heating mantles assure both safe and efficient heating of chemicals in this 10-gallon Mark II fractionator used in the pilot plant of a well-known oil refinery.

Here are some of the advantages that make Glas-Col heating mantles a must for pilot plant applications:

Safety . . . Glas-Col pilot plant heating mantles are safe . . . they're designed so there's no air chamber beneath the flask where explosive vapors can accumulate if the liquid being heated boils over. There are no open flames or dangerously exposed wires.

Rugged . . . Glas-Col pilot plant heating mantles are made of

"R" fabric, a newly developed, extra tough material which is extremely rugged and readily withstands heavy and punishing pilot plant usage.

Zone heating . . . Power input for flask mantles is divided into four circuits. Lowest circuit covers small area at bottom of receptacle being heated. The other three circuits provide heat for succeeding bands up the wall of the receptacle. As liquid level recedes, power to upper circuits can be decreased or shut off. This feature eliminates (1) superheating of vapors, (2) damage of heat-sensitive liquids by splashing against superheated flask wall, and (3) cracks or breaks due to relatively cool liquid coming into contact with wall of receptacle.

Glas-Col Apparatus Company, DEPT. CP
711 Hulman Street, Terre Haute, Indiana

The world's largest manufacturer of heating mantles

GLAS-COL

Electric Heating Mantles

Trademark Registered U. S. Patent Office



U. S. Patents

2,282,078

2,739,220

2,231,506

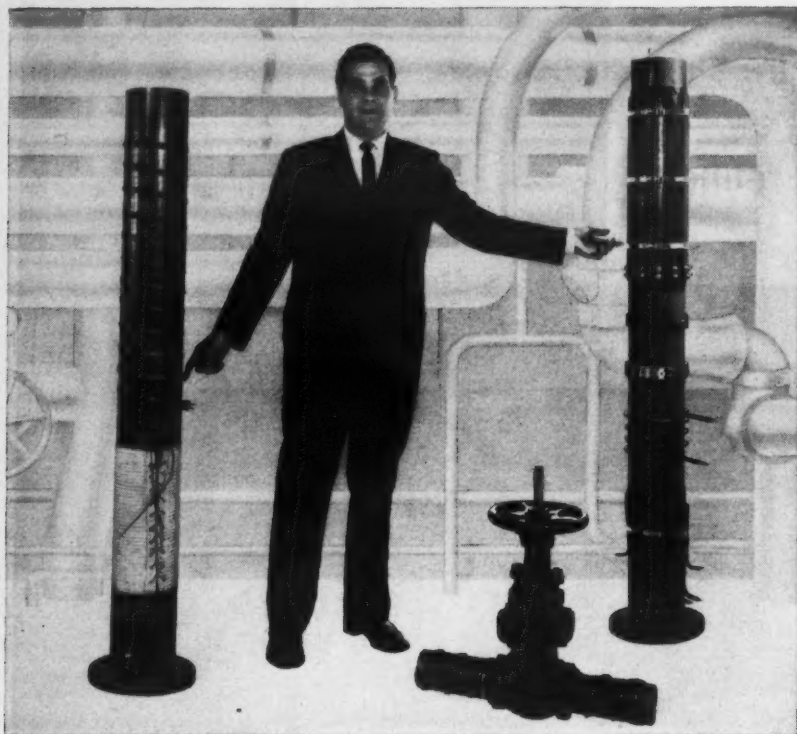
2,739,221



Glas-Col 72-liter heating mantle. Notice connecting cables for mantle's four different circuits.

Check 3398 opposite last page

What's the best way to heat a pipe?



Your CHROMALOX Man has the Answer

Your Chromalox Man can help you determine which of the above pipe heating methods is the one best electrical answer to your problem.

Maybe Chromalox Strip Heaters best meet your operating conditions. Quickly and easily installed at low initial cost, they provide uniform, accurate temperatures by either automatic or manual control. Lengths from 4" to 96" can be clamped in place side by side, or, half-round strip heaters may be bolted together to a minimum inside radius of 3½".

Or perhaps Chromalox Tubular Heaters are the answer. These versatile heaters are available in straight lengths or bent to any shape you may require.

Still other pipe heating problems can be solved quite simply by Chromalox Pre-Fab woven electric heaters, held in place by lacing, adhesives or snap-fasteners. Chromalox Thermwire Tape and Cable answer hundreds of other problems that can be solved by low temperature localized heat.

What's the best way for you? Just call your Chromalox Representative, listed at the right. He has the fast, clean, safe, accurate, economical ELECTRICAL ANSWER. He's backed by the world's largest stock of industrial electric heaters, ready for immediate shipment. And, he offers factory design engineering service for special applications.



CHROMALOX

Electric Heat

INDUSTRIAL • COMMERCIAL • RESIDENTIAL

EDWIN L. WIEGAND COMPANY

7517 Thomas Boulevard • Pittsburgh 8, Pa.

Check 3399 opposite last page

Call Chromalox for the man with the ELECTRICAL ANSWERS

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Trinity 5-7244</p> <p>BALA-CYNWYD, PA.
J. V. Calhoun Company
349 Montgomery Ave.
Mohawk 4-6113
Greenwood 3-4477</p> <p>BALTIMORE 18, MD.
Paul V. Renoff Company
333 East 25th St.
Hopkins 7-3280</p> <p>BINGHAMTON, N. Y.
R. P. Smith Co., Inc.
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Phone 4-7703</p> <p>BLOOMFIELD, N. J.
R. L. Faber & Assoc., Inc.
1246 Broad St.
Edison 8-6900
New York: Worth 4-2990</p> <p>BOSTON 11, MASS.
Leo C. Pelkus & Co., Inc.
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Liberty 2-1941</p> <p>BUFFALO 2, N. Y.
Niagara Electric Sales Co.
505 Delaware Ave.
Summer 4000</p> <p>CHARLOTTE 2, N. C.
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Edison 4-4244
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Fred I. Tourtelot Company
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Harrison 7-5464</p> <p>CINCINNATI 8, OHIO
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3009 Canton St.
Riverside 1-9004</p> <p>DAVENPORT, IOWA
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Phone: 6-5233</p> <p>DENVER 2, COLO.
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2415 Fifteenth St.
Glendale 5-3651
Genesee 3-0821</p> <p>DES MOINES 14, IOWA
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|---|---|



INSTRUMENTS & LAB

60 reactions an hour automatically.

During first part of cycle, while metering chamber is slowly filling, colorimetric reagent is slowly flowing from a reagent reservoir to reaction chamber. Standard reservoir capacity is adequate for one day's operation, but special reservoirs can be designed if needed.

As sample and reagent mix, their combined volume is sufficient to rise over the top of a second siphon, discharging entire contents of reaction chamber into optical chamber below.

Here the color can be observed and compared with color standards. An optional color standard photocell can also be connected to actuate an alarm or off-on control system.

Because optical cell volume is only 8 cc, it is first flushed out with twice its volume before the last portion of mixture it retained. Cell is never empty, and each sample has traces of previous sample in it. But the amount is slight and presents no problems. Optical cell overflows and sample reservoir discharges into a common drain chamber at bottom of analyzer.

(Chemalyzer is product of Florida Instrument Co., division of Milton Roy Company, 1300 E. Mermaid Lane, Philadelphia 18, Pa.)

Check 3400 opposite last page.

Temperature Monitor

From page 117

can be corrected by throttling manifold valving to divert greater proportion of hot wax from heat exchanger to the cool tank until wax returns to proper temperature, which would be shown by indicator on thermistor controller.

(Four-point thermistor controller is development of Fenwal Incorporated, 113 Pleasant St., Ashland, Mass.)

Check 3401 opposite last page.

Electric control system uses 'building block' unit interchange

Eight years in development,
system has 20 units

Uses: As an electronic system for process control to supplement existing pneumatic equipment, or to integration with data handling systems and computers.

Features: Electronic control system is based on a "building block" unit design, easily interchanged.

Description: Eight years in development, electronic process control system is composed of 20 units, all miniaturized and most with transistors. Use of transistors eliminates need for power source at field-mounted instruments. Two-wire system transmits a 4-20 ma signal as standard. Transducers will accept a 3-15 psi input.

(ElectriK Tel-O-Set system is product of Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.)

Check 3402 opposite last page.



Sample 'thief' . . .

. . . is designed to "steal" samples without having material contaminate "thief". It extracts air from container to furnish motive power for sample transfer.

("Golden Thief" is product of W & W Manufacturing Company, PO Box 9311, Chicago 90, Illinois.)

Check 3403 opposite last page.

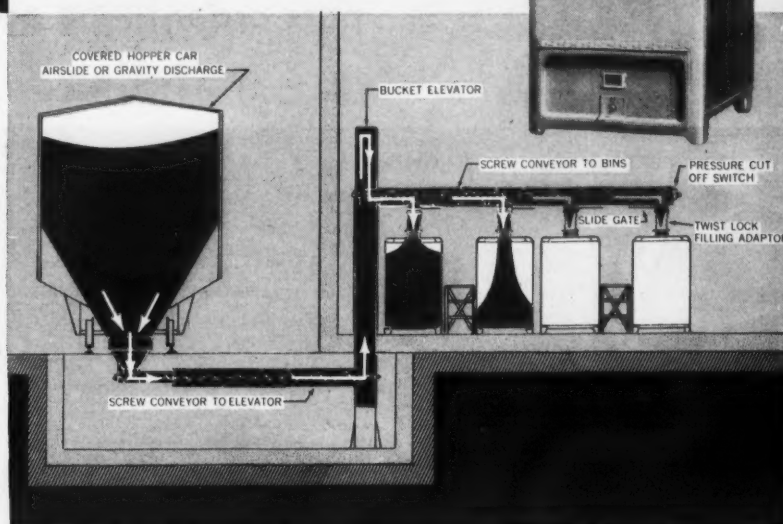
in bulk handling...

TOTE SYSTEM

BULK HOPPER CARS

offers GREATEST transportation flexibility

*Tote, a complete, mechanical, automatic bulk handling system, is based on metal bins (aluminum, stainless or carbon steel, monel, or magnesium) plus filling and discharging equipment. Here is how it fits any transportation situation:



Tote System can be adapted readily to the use of bulk covered hopper cars, gravity discharge or Airslide®, when these are furnished free by the shipper or by the railroad.

The drawing above shows how quickly and easily mechanical or pneumatic car unloading and Tote filling equipment moves the contents of the car into Tote Bins. The Bins can then be weighed and placed in your warehouse. (Only with Tote

can you weigh your incoming material as a check against your supplier's invoice and also for inventory purposes.)

One man can handle the entire operation — unloading the car, filling, weighing, warehousing the Bins, and moving previously filled Bins from warehouse to discharge stations. In many installations, 100,000 pounds of material are being moved through the complete cycle in less than four hours by one man.

CONTAINER CARS

This special railroad car carries 26 Bins which can be filled by your supplier while still on the car. At your plant or team track, one man with a fork lift can unload the car in 35 minutes. A mileage allowance of 3.7 cents is paid for every mile this car travels.

TRUCKS

If bulk hopper trucks are employed, they can be unloaded into Tote Bins by the same method used to unload rail hopper cars. Or up to 16 Tote Bins, depending on weight restrictions, can be carried on conventional trucks and trailers.

*Why not let our engineers survey your plant at no obligation?
Meanwhile, write for new catalog containing complete details*

TOTE SYSTEM, INC.

680 SO. 7TH

BEATRICE, NEBRASKA

*Tote and
Tote System
Reg. U. S. Pat. Off.

Check 3404 opposite last page



Order filling was a time-consuming, error-prone process at Pacquin-Leeming Corporation's former plant, with attendant wasted floor space and congestion. Now . . .

Live Storage System Saves

. . . puts order-filling accuracy at all-time high

PROBLEM: There was considerable lost time and too many errors in filling orders at the Hawthorne, N. J., plant of Pacquin-Leeming Corporation. Two men filled orders from stacked pallets and accumulated each order on one or more pallets. An average order, usually 50 to 75 pieces, required at least 110 ft of walking. Orders shipped each day averaged around 250 to 300.

Palletized orders were set on the floor adjacent to the



Working in convenient narrow aisle, picker is able to pick from pallet rack on right and carton rack on left

Order filler returns pallet to rear of rack by easy lever operation; no pallet handling is required

Racks are loaded from rear. Same truck operator removes empty pallets from rear also



S 6800 sq ft

shipping dock to await arrival of trucks. Pickers were so busy trying to get orders filled that no time was left for checking. Although a check was made when loading the order, quite a few errors occurred in shipments.

Solution: In its new 86,000-sq-ft plant in Parsippany, N.J., Pacquin-Leeming installed a live storage system consisting of gravity flow racks for pallets and cartons.

Pallet racks gravity feed 2500-lb pallet loads to an order picking aisle. No power, dollies, or other auxiliary equipment is necessary for pallets to ride on. Pallets ride down at a controlled speed of between 10-20 ft/min regardless of split, broken, and warped boards and protruding nails.

Pickers do not handle pallets. An easy lever-operated mechanism returns empty pallet to rear of rack with no effort or handling on part of operator. Racks are loaded and empty pallets removed from the rear.

Picking aisle has just enough room for walking and for a take-away conveyor. No storage space is wasted.

Cartons are stored across picking aisle, within easy reach, in racks with free-rolling ball bearing wheels to support packages in rows. Racks operate on gravity flow principle. Packages loaded in rear of rack roll forward to a stop in front. As required, a package can be lifted out easily and the next identical

package rolls down to take its place.

Results: Due to installation of the live storage system for pallets and cartons, walking has been reduced to 20 to 30 ft per order. Orders are not filled until a truck arrives, eliminating floor congestion. One checker and one picker are able to fill orders in one-half previous time, and order filling accuracy is at an all-time high.

Since orders can be filled in four hours, picker and checker are able to spend remaining four hours in production department. Order-filling area has been reduced from 9600 sq ft to 2800 sq ft. Area for temporary storage of palletized orders has been eliminated completely.

Since racks are loaded and empty pallets removed from the rear, there is no truck traffic in the picking aisle. The lift-truck operator who previously spent all day in handling orders is released for work elsewhere in plant since orders flow directly from racks to trucks by conveyor. Safety factor is greatly improved because order-filling personnel are not required to handle pallets in any way.

Plant manager estimates new order-filling system will pay for itself in two years.

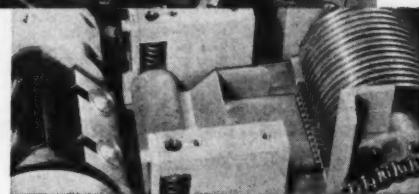
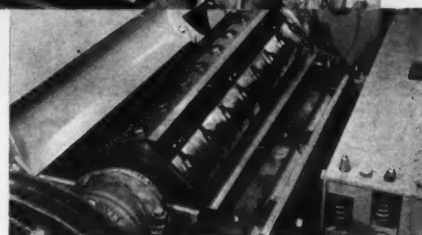
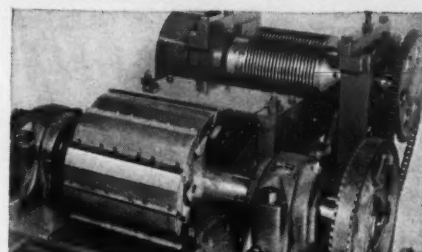
(Palletflo gravity racks and Versarack carton flow racks are products of M-H Standard Corporation, 515 Communipaw Ave., Jersey City 4, N.J.) Check 3405 opposite last page.

3 leading Plastic Pelletizers

cut

plastic pellets to

uniform size



You can find the exact type of cutter to meet your plastic pelletizing needs at Taylor-Stiles.

All three of these cutters produce pellets of uniform size with a minimum of fines and practically no longs—features which appeal to firms which extrude or mold plastics.

Power requirements are relatively low due to Taylor-Stiles shearing principle—the most efficient and economical method of cutting known to industry today.

Many of Taylor-Stiles Pelletizers are used by important manufacturers of basic plastic materials. Indeed, one of the leading producers has recently switched from its former type of cutters and standardized in its various plants on Taylor-Stiles Pelletizers.

Illustrations: (Top) #700 Series—for high speed, ultra-precision work. Used for short cuts and thin stock—in either continuous sheet or rod form. For full details, write for bulletin 216 for rod stock or 213 for sheet stock.

(Middle) #200 Series for cutting continuous sheet stock of various thicknesses; available with square, bevel, or notched circular knives. For complete information write for folder 213 or 212.

(Bottom) #800 Series (formerly called #106) for laboratory or small production use—maximum width of stock—6"; available in 1, 2, 4, 8, or 16 cross-cut knives. Write for folder 217 for full information.

At Taylor-Stiles you will find the machine to fit your precise needs—probably in one of the three models shown here. If your requirements are special, we can modify one of these models to meet them.

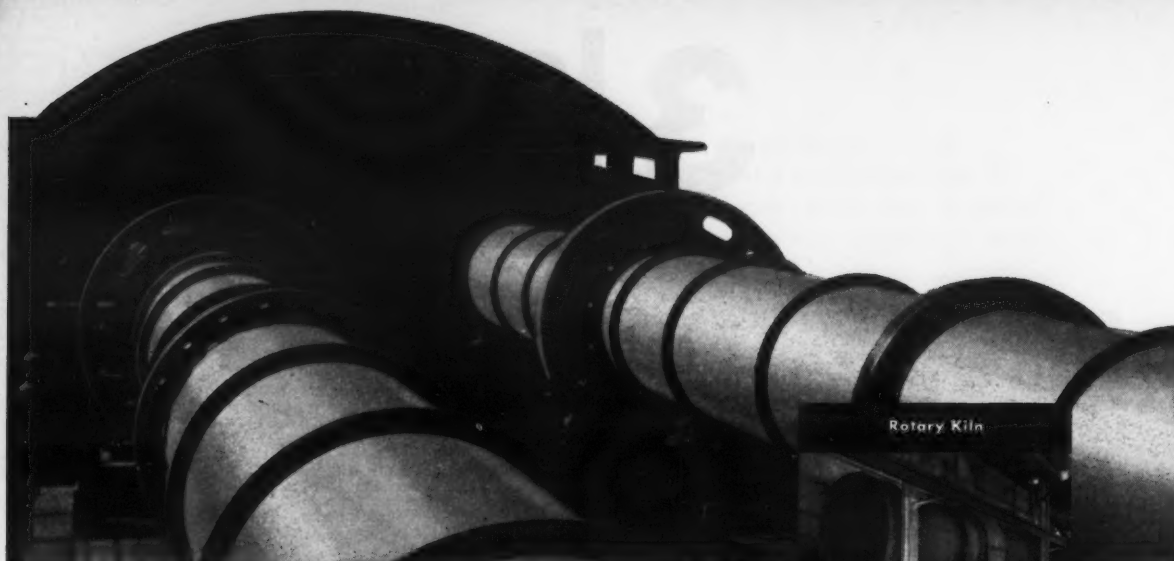
For full details, write for illustrated technical bulletin describing the series in which you are interested.

TAYLOR, STILES & CO.

20 Bridge Street

Riegelsville, New Jersey

Check 3406 opposite last page



Heat Transfer Efficiency

...depends on more than equipment

AN array of even the best heat transfer equipment isn't enough. To increase production, lower processing costs and improve product quality, this equipment must be coordinated into an efficient flow design. Allis-Chalmers recommends equipment only after a detailed study of all processing factors.

Call in an A-C Engineering Team

Allis-Chalmers engineers concern themselves with the entire operation: the evaluation of variables . . . plant design . . . the integration of equipment into a complete process. A-C has complete facilities for pre-recommendation research, and pilot plant testing, if necessary.

Expert installation supervision and local field service are supplied by Allis-Chalmers. After installation, Allis-Chalmers provides periodic check-up, maintenance advice and, of course, fast parts service for the life of the equipment.

Ask your nearby A-C man for Bulletin 25C6177, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

Partial list of material processed by A-C heat transfer equipment

Limestone	Alumina	Phosphates	Fuller's Earth
Lime	Bauxite	Refractories	Nickel Ore
Dolomite	Manganese Oxide	Foundry Sand	Copper
Magnesia	Iron Ore	Petroleum Coke	



A-5692

ALLIS-CHALMERS

Check 3407 opposite last page

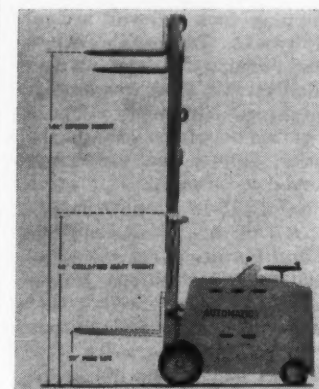
HANDLING & PACKAGING

High lift feature gives fork trucks dual purpose

Uses: Attachment for fork-lift trucks.

Features: Through this device, manufacturer claims one fork-lift truck becomes a dual purpose machine that can be used for high stacking and unstacking as well as for loading and unloading operations which formerly required two separate trucks. Mast lifts to height of 144" and collapses to height of 68".

Description: Fork-truck lifting unit with 68" mast was



High lift attachment, which extends up to 144", is shown here on 2000-lb capacity fork-lift truck

designed for trucks with 2000- and 3000-lb capacities. According to manufacturer, full lifting height of 144" is an increase of 39 lift inches over standard 68" mast. Unit has 20" free lift.

(Sky-Hi-Lift is product of Automatic Transportation Co., Div. of The Yale & Towne Mfg. Co., 101 W. 87th St., Chicago 20, Ill.)

Check 3408 opposite last page.

Rate-control feeding, in-transit drying of bulk materials

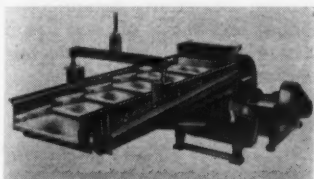
Uses: For feeding bulk materials.

Features: Direct-panel heated troughs enable unit to simultaneously afford effective rate-controlled feeding and

HANDLING & PACKAGING

efficient bulk materials in-transit drying.

Description: Feeding movement of heavy- and extra-heavy-duty electromagnetic heaters is result of 3600 electromagnetic, pitch-directed vibrations per minute. These



Direct-panel heated trough feature affords simultaneous heating and drying

vibrations are easily controlled through continuously variable degrees of power by unit's separate controller.

Drying is accomplished by rate-controlled movement of layer of material over cascaded series of electrically heated panels. These panels are loosely interlocked to act as louvers, allowing introduction of forced air from a turbo-blower system through and across cascading material to dissipate vapor produced in drying process.

Panels can be pivoted to adjust slope to best suit structural and flow characteristics of different materials. Heat intensity is thermostatically or percentage-timer regulated to most effectively accomplish desired moisture reduction.

(Heavy- and extra-heavy-duty electromagnetic heaters are available from Syntron Co., 110 Lexington Ave., Homer City, Pennsylvania.)

Check 3409 opposite last page.

Steel strap feeding assembly for strapping large packages at rate of 4½ feet per second is described in eight-page folder which gives specifications and capacities of all models. Booklet AD 276 — Acme Steel Co., 135th St. & Perry Ave., Chicago 27, Ill.

Check 3410 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

EMERY Engineered WEIGHING SYSTEM NEWS

EVALUATE THE PRACTICAL ACCURACY OF YOUR ENTIRE TANK WEIGHING SYSTEM

DO NOT BE MISLED BY ACCURACY CLAIMS MADE FOR A SINGLE COMPONENT

Has it occurred to you that a glib sales claim of .1% accuracy in a weighing component is no guarantee whatever that the system will operate with such accuracy under normal service conditions? In fact, every instrument engineer knows that consistent accuracies of .1% under normal operating conditions are a practical impossibility.

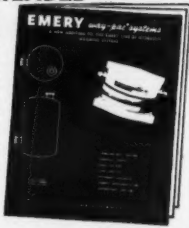
Under controlled laboratory conditions consistent .1% accuracies are barely possible . . . but in the field . . . practically never!

Emery Engineered Weighing Systems are designed for the needs of each particular job. It is through this individual engineering that we are able to achieve a maximum accuracy which is impossible when components are lifted from stock.

NEW WAY-PAC BULLETIN IS NOW AVAILABLE

Our new Bulletin 582 covering the WAY-PAC line of engineered weighing systems is now being distributed throughout the industry. If you haven't done so yet, send for your copy right away.

When writing, refer to Item 1005.



In selecting your tank weighing system, investigate thoroughly all sales claims of fantastic component accuracy. Evaluate the practical accuracy of the entire system. Do not be misled by the accuracy claims that are made for a single component. After your evaluation . . . buy the system with the best practical approach to your weighing problem . . . the Engineered Weighing System by Emery.

When writing, refer to Item 1001.

TANK EXPANSION DAMAGE PREVENTED WITH EMERY ENGINEERED WEIGHING SYSTEMS

The unique and exclusive Emery Rolling Ball Head built into the Emery Load Cells is your guarantee that no damage to the weighing system will result from inevitable tank expansion and contraction.

The Rolling Ball Head is a clever device which allows side motion of tanks due to expansion and contraction without sacrificing any of the accuracy of the Emery Engineered Weighing System. A system which does not take into consideration this expansion and contraction is not properly designed.

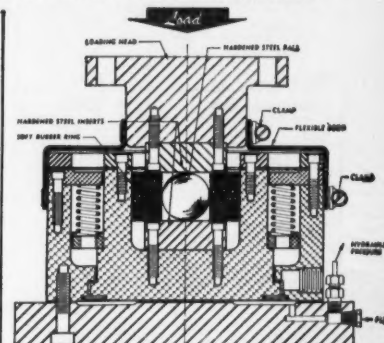
When writing, refer to Item 1003.

INSTRUMENT COMPANIES RECOGNIZE DESIRABILITY OF STRONGER SIGNAL

Standardization on an electrical operating signal in the range of 10 to 50 millivolts for electrical instruments indicates the trend of today's thinking as evidenced by the instrument industry.

Should this standardization program become effective tank weighing system users may take note that the Engineered Weighing System by Emery can team up immediately with such instrumentation without the use of additional equipment.

When writing, refer to Item 1002.



Key to protection of Emery Weighing Systems from side load damage is the unique design of the rolling ball head . . . an Emery exclusive.

EXPLOSION-PROOF FEATURE VALUABLE IN MANY CHEMICAL TANK INSTALLATIONS

The importance of explosion-proof equipment in many chemical installations cannot be minimized. There is no room for deliberation . . . no opportunity for experimenting. Either the equipment is explosion-proof or not.

Emery Engineered Weighing Systems can be supplied to operate completely on either the hydraulic or pneumatic principle of load measurement. However, when electrical instrumentation is specified, we will supply this instrumentation in explosion-proof cases which have underwriter approval. An Emery Engineered Weighing System is available to provide positive explosion-proof protection in practically every

chemical application. Inquire for detailed information.

When writing, refer to item 1004.



Your Emery Weighing System can be completely hydraulic or pneumatic or it can contain electrical instrumentation in explosion-proof cases for positive protection.

The A. H. Emery Co., New Canaan, Conn.

I am interested in the following:

Item 1001 ☐ Item 1003 ☐ Item 1005 ☐

Item 1002 ☐ Item 1004 ☐

Seeing Representative ☐

Name

Title

Address

City State



THE A. H. EMERY COMPANY
New Canaan, Conn.

Engineered WEIGHING SYSTEMS

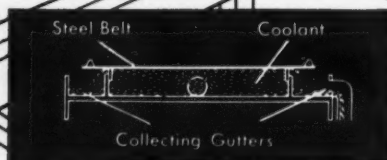
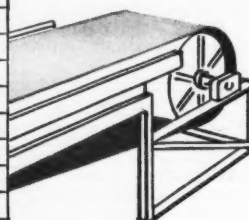


Check 3411 opposite last page

Can you use
this kind of
Continuous
Cooling capacity?

ACTUAL EXAMPLES OF SANDVIK STEEL-BELT COOLER OUTPUT

MATERIAL	FEED TEMP. F°	DISCHARGE TEMP. F°	CAPACITY	BELT WIDTH	COOLING LENGTH
Resins					
Wood Rosin	450°F	130°F	5000 #/hr.	32"	120'-0"
Hydro Carbon Resin	400°F	100°F	6000 #/hr.	32"	84'-0"
Epoxy Resin	425°F	100°F	2800 #/hr.	32"	36'-0"
Vinyl Resin	285°F	100°F	6000 #/hr.	32"	72'-0"
Synthetic Resin	300°F	90°F	5400 #/hr.	32"	48'-0"
Weed Resin	285°F	100°F	6000 #/hr.	32"	72'-0"
Sulphur	290°F	150°F	25 tons/hr.	32"	250'-0"
Chlorinated Wax	300°F	100°F	1000 #/hr.	20"	12'-0"
DDT	212°F	130°F	2400 #/hr.	32"	50'-0"
Coal Tar Pitch	350°F	130°F	4000 #/hr.	32"	72'-0"
Phosphate Glass	1900°F	200°F	500 #/hr.	20"	12'-0"
TNT	180°F	140°F	2200 #/hr.	32"	12'-0"
Ammonium Nitrate	400°F	160°F	7800 #/hr.	32"	36'-0"
Sodium Metasilicate	158°F	85°F	3000 #/hr.	32"	72'-0"



Schematic End View of Sandvik unit
illustrates cooling arrangement

The above table shows you some of the continuous cooling jobs that Sandvik solid steel belt units are doing today.

How The Patented Sandvik Steel Belt Cooler Operates—The loaded steel band "floats" along on an open trough of circulating water or other coolant. The coolant pressure assures 100% contact with the belt. Surplus coolant overflows into gutters which collect and return it for recirculation.

The trough is so designed that no coolant can get on top of the belt.

Sandvik's engineering can supply cooling data on a wide variety of material. Sandvik also has portable, experimental water-bed units available on which you can make small scale trials in your own plant.

Write, wire or phone for further details.

SANDVIK STEEL, INC. Steel Belt Conveyor Department

1702 Nevins Road, Fair Lawn, N. J. 07410 7-6200

Branch Offices: Cleveland, Detroit, Chicago, Los Angeles, Montreal
IN CANADA—Sandvik Canadian Ltd., P.O. Drawer 1335, Sta. Q, Montreal 9, P. Q.

Manufacturers of Steel Belt Conveyors For Over 40 Years



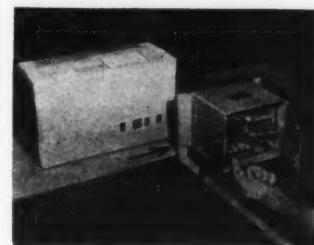
HANDLING & PACKAGING

**Eliminates human error,
counts and sorts
up to 30 items**

Selects any type of carton,
regardless of size, shape

Uses: Unit is designed specifically for operation where carton selection cannot be made on basis of size and where costly multi-selector equipment is unnecessary.

Features: Eliminating possibility of human error, device



Carton selector automatically
counts and sorts up to 30 different
items by a five-bar code

selects any type case, box, or carton — up to 30 different items — regardless of size or shape, by means of a five-bar code. Perfect orientation of cartons is not necessary, as markings may be read when distances vary by several inches and angles vary up to 10 degrees.

Description: Carton selector automatically selects cases, boxes, or cartons of various sizes or shapes. Selector switches may be set to recognize markings as cartons pass at speeds up to 180 fpm. Code may be printed on cartons at the same time other printing is done; no special inks are required.

Unit also provides an output signal that can be used as needed. One such use might be to activate a conveyor switch and automatically control the flow of goods and sort them for further processing. Unit is completely transistorized for maximum reliability. Approximate sizes is 7½ x 6½ x 6".

(Model 410 carton selector is manufactured by Atronic Products, Inc., One Bala Ave., Bala-Cynwyd, Pa.)

Check 3413 opposite last page.

Check 3412 opposite last page

**THAT'S
INTERESTING**

**Timber! —
or is it?**

Lightweight inorganic planks and panels made in the laboratory may be supplementing the nation's lumber supply. The "timber" is fireproof, rot-proof, and will not expand in humid atmospheres. Although it has only about half the strength of hardwoods, the synthetic lumber is strong enough for many jobs where wood is now used.

**Seaweed
pudding?**

If you're an adventurous gourmet perhaps you'd like to tickle your palate with a dessert of seaweed pudding. Recently patented, pudding consists of dry powder mix made by combining an extract of red seaweeds with a mixture of edible salts. Mixed with cold milk, it makes a tasty pudding. You try it and let us know. (D&O News, Dodge & Olcott, Inc.)

For more information on product at right, specify 3414 see information request blank opposite last page.



JANUARY 1959

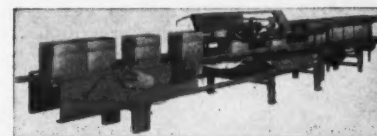
Simoniz
puts "protection"
in a can

Packomatic®
puts the cans
in a case



Packomatic equipment feeds, forms, positions, loads, seals and imprints corrugated shipping containers automatically. However you ship—in multi-ply paper bags, or in corrugated shipping containers; whatever you "package"—a can, a carton, a box or a bale—there's a Packomatic machine designed to handle your shipping container requirements. Packomatic machines, geared to your production line, will feed, form, position, load, seal and imprint corrugated containers automatically—or do any of these operations singly as a complement to your existing packaging facilities. Let one of our sales engineers suggest the start of a long-range packaging program for your plant. Investigate the Packomatic method of cutting costs and boosting production. Call, write or wire today.

Fully-automatic Packomatic Case Former-Loader, part of a fully-automated production line at the Simoniz plant, Kankakee, Illinois. Other Packomatics on the Simoniz line include Case Sealers and Case Imprinters.



Begin to automate your packaging line with this high-speed, fully-automatic Case Sealer. Aligns loaded cases, positions flaps, glues, seals and discharges—and no operator needed! Available in wide range of sizes. Semi-automatic, too. Call or write for additional information.

J. L. FERGUSON CO. Joliet 6, Illinois

PACKOMATICS include the Bale Sealer • Case Sealers • Opener-Loaders • Case Imprinters • Telescoping Volumetric Fillers • Packer-Glueers • Semi-automatic or fully-automatic.

NEW! STEARNS INDOX V Pulley

**gives you
the lowest cost
magnetic protection**

**CHECK
THESE
ADVANTAGES**

**Costs nothing
to operate**



Now — for the first time — you can buy a permanent magnet pulley that equals expensive electromagnetic types in performance! Yet it will cost you less than for ordinary permanent pulleys!

If your process involves handling bulk materials on conveyor belts, Stearns Indox V pulley will remove small or large tramp iron particles *continuously and automatically* . . . at much lower initial cost—no operating cost.

Indox V — the amazing ceramic magnet material used exclusively in Stearns magnetic pulleys and separators — is the reason for this remarkable performance. *Radial pole design* produces a powerful magnetic field that blankets the entire conveyor burden, pulls out tramp iron far more efficiently than conventional pulleys.

Stearns Series "410" Permanent Magnet Pulleys — and Series "710" for deeper conveyor burdens — are available in standard widths from 12 to 48 inches, and in diameters of 12, 15, 18, 20 and 24 inches. Call your Stearns representative, or write for free literature. Ask for Bulletin No. 1021B.

**No chance of
power failures**

**No rectifier
needed**

**No maintenance
required**

**Impervious to
moisture**

**Radial design
boosts efficiency**

STEARNS MAGNETIC PRODUCTS

A DIVISION OF THE INDIANA STEEL PRODUCTS COMPANY

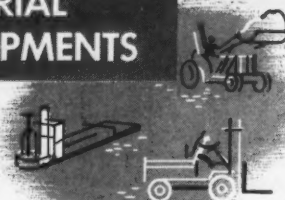
635 SOUTH 28TH STREET

MILWAUKEE 46, WISCONSIN

Check 3415 opposite last page

LATEST INDUSTRIAL TRUCK DEVELOPMENTS

**. . . in design, capacity,
operating features, and
accessories for improved
performance and safety**

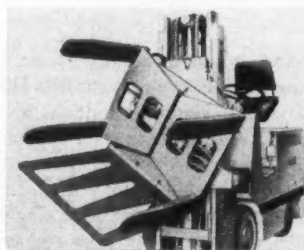


For fast maintenance . . .

. . . all electrical contacts and hydraulic controls of this stand-up electric lift truck can be exposed in an easily accessible, vertical position in less than one minute. As indicated in the three inset photos above, this can be accomplished by simply unlocking and swinging the steering post to the rear, lifting the hinged truck top 90°, making all the controls handy for maintenance.

Available in 2000-, 2500-, and 3000-lb capacities at 24" load centers and total lift height of 98", the "Brute" is manufactured by Hustler Corporation, 17799 Elm Rd., Wiloughby, Ohio.

Check 3416 opposite last page.



'Settling out' of liquid . . .

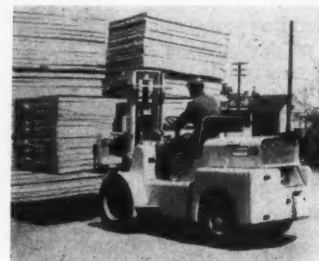
. . . in storage is prevented by this lift truck attachment designed to invert containers. Developed to handle palletized loads of containers, the attach-

ment is expected to be of particular value to manufacturers of soap, paints, and foodstuffs where separations of material in storage cause a problem.

Attachment uses two pairs of hydraulically operated forks, lower pair fitting into pallet on which the containers are stored, and the upper pair bringing an empty pallet down on top of the load to hold it securely in place. With load secured, attachment rotates 180° to position load upside down on the second pallet. Pallet formerly on the floor is removed by raising upper set of forks.

Light side-plate is bolted between attachment forks to prevent load slipping out from between pallets during rotation. Lift truck attachment is development of Materials Handling Div., The Yale & Towne Manufacturing Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

Check 3417 opposite last page.



Guarantee on clutch . . .

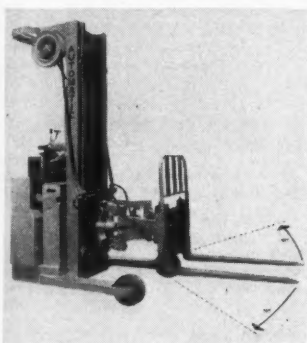
. . . is a 12 month unconditional one on this 6000-lb pneumatic-tired fork truck. Clutch is mounted in horizontal position, making it fully accessible for plate change in ten minutes or less. Wear is said to be considerably less than on conventional installations because clutch operates at less than one-half engine speed.

Truck was designed for easy

maintenance and particular attention was given to simplifying the lubricating system. Generous use of rubber mountings and steel bearings eliminate many hard-to-get-to pressure fittings. Power-assisted clutch gives complete starting and inching control without use of costly and complicated fluid coupling or torque converter.

Available with both single and dual drive wheels, truck can be equipped with all standard type fork truck attachments. Speeds up to 19 mph can be obtained. Model G-60 fork truck is product of Mercury Mfg. Co., Subs. of Pettibone Mulliken Corp., 4710 W. Division St., Chicago 51, Illinois.

Check 3418 opposite last page.



Narrow aisles . . .

. . . are no problem with this "swing-reach" truck which projects the forks forward to reach out for the load and swing in unison right or left of center up to 30°. This swing feature, available on trucks with 2000-, 3000-, and 4000-lb capacities, provides forks with 60° radius which eliminates need for positioning truck to pick up load.

When collapsed, swing-reach mechanism makes entire unit only 3" longer than standard truck model. Truck attains maximum lift height of 130" from collapsed mast height of 83". "Transveyor" lift truck is manufactured by Automatic Transportation Co., 149 West 87th St., Chicago 20, Ill.

Check 3419 opposite last page.

model H-25 PAYLOADER®



Competitive Tests Prove H-25 Best

Eastern States Farmers Exchange, Inc. purchased four "PAYLOADER" units as a result of competitive tests conducted at their Cambridge, Mass. plant. In these tests, a Model H-25 "PAYLOADER" moved material at a rate of 90 cu. yds. per hour on a 150-ft. (one-way) haul distance — outproduced the other tractor-shovels in the test.

This fertilizer manufacturer serves Pennsylvania, Maryland and the New England States . . . has four plants and a fifth under construction.

One way to be sure you buy the very best in tractor-shovels is to conduct competitive tests in *your own* plant under *your own* conditions. Like Eastern States Farmers Exchange, you'll find that such tests help to cut through the confusion of conflicting claims.

More For Your Money

There are many reasons why the Model H-25 will dig, carry and deliver more yardage or tonnage with lower operating and maintenance costs than anything in its class. It has more breakout force, 4,500 lbs.; equal or greater carrying capacity, 2,500 lbs.; the shortest turning radius, 72 inches; power-shift transmission with two speeds forward *and* reverse; power-steer; exclusive power-transfer differential.

An Ounce of Prevention

The H-25 has been engineered to provide extraordinary protection against dust and dirt damage: triple air cleaner — pre-cleaner and two oil-bath air cleaners; cartridge-type oil filter on all three oil systems; sealed, self-adjusting service brakes; parking brake enclosed in transmission; special grease and oil seals on all vital points.

Why not find out what a Model H-25 can do on your work? Ask your Hough Distributor for a demonstration, and ask about Hough Purchase and Lease Plans too.

HOUGH®



THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS

SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY



THE FRANK G. HOUGH CO.
744 Sunnyside Ave., Libertyville, Ill.

Send data on new H-25 "PAYLOADER"

Name _____

Title _____

Company _____

Street _____

City _____

State _____

1-A-1

Check 3420 opposite last page

Modern AIR CONVEYING for BULK MATERIALS HANDLING

SPROUT-WALDRON

PNEU-VAC

Modernize for greater savings with a Sprout-Waldron PNEU-VAC Pneumatic Materials Handling System. It draws granular, pulverized, and flaky materials by air anywhere you can run a pipe. The unit can be made to cool, to heat, to aerate, to dry.

Pneu-Vac is self-cleaning, does not produce dust, prevents infestation and product intercontamination, saves space, increases production, provides greater safety and better working conditions.

Sprout-Waldron also offers complete lines of the most advanced screw, belt, and drag conveyors . . . bucket elevators . . . and rotary vane feeders. Write for details.



Write for
Bulletin 18-D.

SPROUT-WALDRON

Manufacturing Engineers Since 1886

LOGAN STREET • MUNCY, PA.

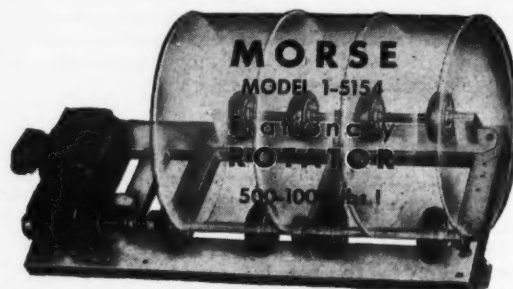
EQUIPMENT FOR SIZE REDUCTION • MIXING &
BLENDING • BULK MATERIALS HANDLING • PELLET-
ING & CUBING • PRODUCT CLASSIFICATION

IN/433



Check 3421 opposite last page

HEAVY DRUM ROTATING



Cuts Costs . . . Fast . . . Safe

You can now mix, blend or tumble loads up to 1000 lbs. with the new MORSE Model 1-5154 Stationary ROTATOR. It is primarily engineered for heavy loads in 30 to 55 gallon drums yet lesser loads can be rotated with equal efficiency. Any diameter drum can be mounted by adjusting only three bolts.

The rugged 1/2 H.P. motor can be geared to give any fixed speed from 5 to 30 RPM. Six inch drive wheels (4) and idler wheels (4) have Neoprene treads for smooth, non-slip revolving. Drive shaft, idler shaft and all welded steel frame are extra rugged construction for long-lasting, trouble free operation.

A double drum model No. 2-5154 with a 2000 lb. capacity is also available. Write today for brochure on complete Morse line.



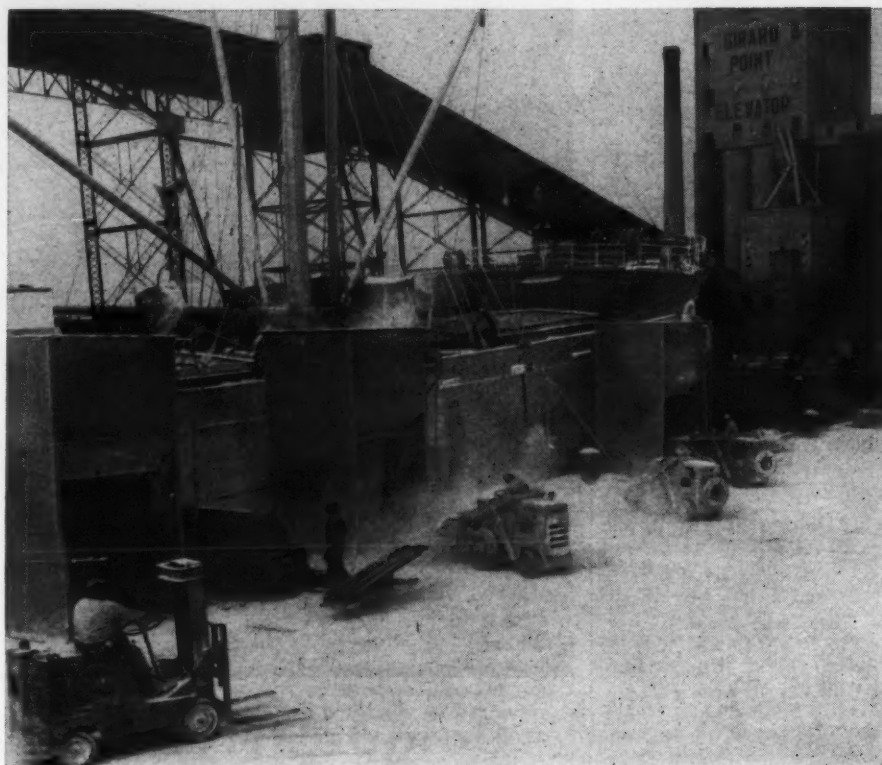
MORSE

MANUFACTURING CO., INC.

757 West Manlius Street, East Syracuse, N. Y.

Check 3422 opposite last page

MATERIAL HANDLING and PACKAGING



BITE, LOAD, RUN: Working on 58-sec loading-unloading cycle, eight tractor shovels cover distances sometimes exceeding 300 yd. Despite speed, distance, and erosive nature of materials, Independent Pier finds maintenance is low as it . . .

Moves 1000 tons of dusty clay in eight-hour shift



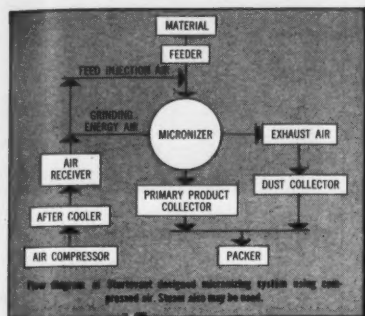
Onto a conveyor belt goes a heaping load of clay deposited by the tractor shovel. The conveyor piles the clay into "hills" 15 feet high

Problem: Handling of imported china clay once gave Independent Pier Company, Philadelphia, Pa., its biggest headache. Problem stemmed from three factors: Product, heavy and solidly packed in bulk, creates fine, powdery dust when moved, coating men and machines; avoiding contamination is imperative as the several grades of clay contained in each shipload must be handled independently; high-speed unloading is necessary to avoid extra dock charges.

Solution: Eight tractor shovels were acquired. Their speed and mobility have enabled Independent to develop one of

Need 1/2 to 44 Microns?

**Sturtevant Micronizers*
Make 325 Mesh Obsolete**



One Operation Reduces, Classifies

Sturtevant Micronizers grind and classify in one operation in a single chamber—provide fines in range from 1/2 to 44 microns to meet today's increased product fineness needs. Can handle heat-sensitive materials.

*Production Model
(15 in. chamber)*

No Attritional Heat

Particles in high speed rotation, propelled by compressed air entering shallow chamber at angles to periphery, grind each other by violent impact. Design gives instant accessibility, easy cleaning. No moving parts.

Classifying is Simultaneous

Centrifugal force keeps oversize material in grinding zone, cyclone action in central section of chamber classifies and collects fines for bagging. Rate of feed and pressure control particle size.

Eight Models Available

Grinding chambers range from 2 in. diameter laboratory size (1/2 to 1 lb. per hr. capacity) to large 36 in. diameter production size (500 to 4000 lbs. per hr. capacity). For full description, request Bulletin No. 091.

Engineered for Special Needs

A 30 in. Sturtevant Micronizer is reducing titanium dioxide to under 1 micron at feed rate of 2250 lbs. per hr. For another firm, a 24 in. model grinds 50% DDT to 3.5 average microns at a solid feed rate of 1200-1400 lbs. per hr. A pharmaceutical house uses an 8 in. model to produce procaine-penicillin fines in the 5 to 20 micron range. Iron oxide pigment is being reduced by a 30 in. Micronizer to 2 to 3 average microns.

Sturtevant will help you plan a Fluid-Jet system for your ultra-fine grinding and classifying requirements. Write today.

Can Test or Contract Micronizing Help You?

Test micronizing of your own material, or production micronizing on contract basis, are part of Sturtevant service. See for yourself the improvement ultra-fine grinding can contribute to your product. Write for full details. STURTEVANT MILL CO., 119 Clayton St., Boston, Mass.



*REGISTERED TRADEMARK OF STURTEVANT MILL CO.

Check 3423 opposite last page

HANDLING & PACKAGING

fastest operations on Philadelphia waterfront for ship-to-boxcar and ship-to-storage handling.

Unloading is done in two stages, but integration of the two into one continuous action is necessary to maintain pace. In initial stage, clay is moved from ship's hold to temporary storage hoppers on dock; in second, material is transferred to boxcars or storage.

Considerable distance is involved as tractor shovels must travel from 60 feet to 300 yards or more with each load. Distance depends upon whether clay is to be loaded immediately into freight cars or removed to storage.

Results: With these tractor shovels, an average of only 58 seconds is required for the load-unload cycle, helping company set and maintain dollar-saving record of unloading 1000 tons of clay each eight-hour shift. At this pace, it is estimated equipment handles about 150,000 tons of clay during year. Records show servicing and maintenance costs are lower than for any other equipment used on job.

According to Independent's master mechanic, the tractor shovels require less maintenance than other equipment, are easier to service. He cited as a primary reason the fact that dust protection is designed into machines, particularly around engines and brakes.

(Michigan 12B tractor shovels are product of Construction Machinery Division, Clark Equipment Company, Benton Harbor, Mich.)

Check 3424 opposite last page.

Conveyor chains for transporting small- and moderate-size items and containers in various industries are covered in bulletin which gives information on eight types. Bul 5860 — Chain Belt Co., Dept. P. R., Milwaukee 1, Wis.

Check 3425 opposite last page.

Fork truck operating and design specifications are provided in four-page bulletin on 3000 lb capacity electric-powered fork truck. Model F-45T3 Bul — The Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.

Check 3426 opposite last page.

Make NEWARK your source of supply for Wire Cloth and Wire Cloth Products. We weave all of our own cloth from which we fabricate parts for our customers...thus insuring both quality of cloth and accuracy of construction.

Newark Wire Cloth is available in all standard widths, all meshes, all commercial metals...the Newark line is a complete line even up to 400 mesh cloth. And if your problem is one of parts design, our engineers will be glad to aid. May we quote on your requirements?

NEWARK
for ACCURACY

Newark Wire Cloth COMPANY

351 VERONA AVENUE

Newark 4, New Jersey

Check 3427 opposite last page



ALLEN-BRADLEY

Cutting Costs in
the Chemical Industry

HANDLING & PACKAGING



Time, labor savings . . .

. . . in the handling of extremely large single-phase pallets of latex material were accomplished at the Firestone Rubber and Latex Products Company, Fall River, Mass. Load weight was carried over widely separated load points, and low chassis weight of the truck permitted operation on wood floors having capacity of between 125 to 150 lb/sq ft.

Before use of truck, shown above, boxes of material had to be piled manually, and it was impossible to use the air rights because no other plant equipment could operate in these areas.

(Hydroelectric Model K3HTP is product of Lift Trucks, Inc., 2425 Spring Grove Ave., Cincinnati 14, Ohio.)

Check 3429 opposite last page.

**Controls rate of feed
 $\pm 1\%$ of scale reading**

Uses: As controlling weigh belt in conjunction with feeder for feeding fibrous, shredded, flaked, chipped, extruded, pelletized, or any low-density, relatively lightweight product such as wood pulp, cotton linters, rock wool, glass fiber, textile fibers, etc.

Features: Unit will control rate of feed with accuracy of $\pm 1\%$ of maximum scale reading.

Description: Controlling weigh belt incorporates constant-speed, chemically inert, lightweight conveyor arranged to continuously and automatically weigh amount of material passing over it. Any variance in weight is immediately transmitted to feeder control, and feeder speed is adjusted to maintain preset rate of product feed.

Unit may be used without

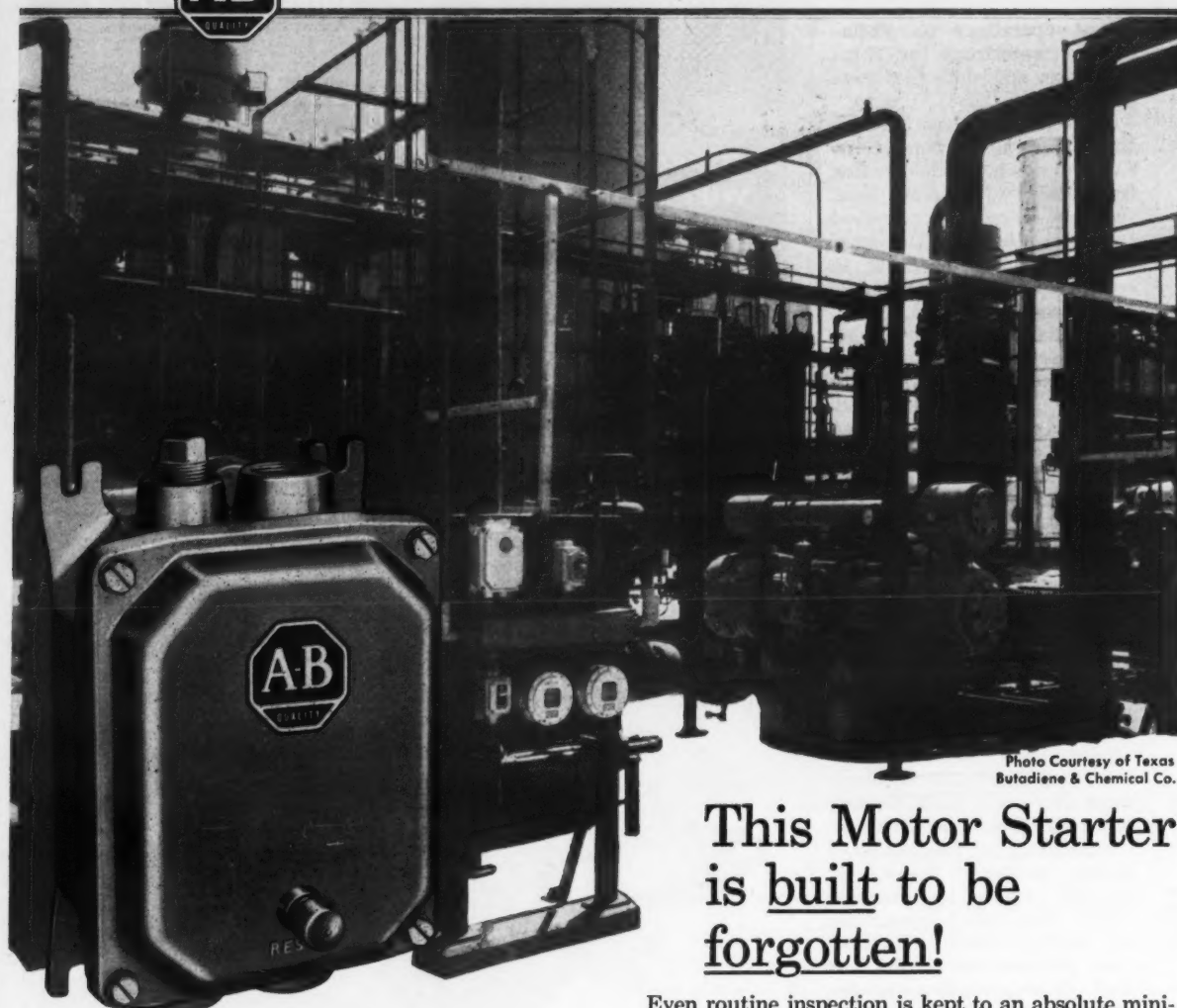


Photo Courtesy of Texas
Butadiene & Chemical Co.

This Motor Starter is built to be forgotten!

Even routine inspection is kept to an absolute minimum with Allen-Bradley motor starters . . . an especially important saving when your installation requires bolted covers, as used with watertight and explosion-proof enclosures.

It's the simple contact mechanism—with only ONE moving part—that enables Allen-Bradley solenoid starters to operate over long periods without attention. With no bearings to corrode or stick . . . no flexible jumpers to break . . . you are assured *millions* of trouble free operations. In addition, there are double break, silver alloy contacts that never need servicing of any kind. And permanently accurate thermal overload relays protect motors against burn-out, irrespective of time or atmospheric conditions.

Specify Allen-Bradley quality controls for *all* your installations . . . and you'll save on maintenance.

Bulletin 709 Size 1 Solenoid Starter
in NEMA Type 4 watertight enclosure



NEMA 9
For Hazardous
Dust



NEMA 7
For Hazardous
Gas Locations



NEMA 8
For Corrosive
Hazardous Gas



NEMA 11
Corrosion-
proof

Allen-Bradley Bulletin 709 across-the-line solenoid starters are made in eight sizes with maximum ratings to 300 hp, 220 volts; 600 hp, 440-550 volts.

ALLEN-BRADLEY CO.
MOTOR CONTROL
QUALITY



Allen-Bradley Co., 104 W. Greenfield Ave.
Milwaukee 4, Wis.

In Canada: Allen-Bradley Canada Ltd.
Galt, Ont.

Check 3428 opposite last page

HANDLING & PACKAGING

an auxiliary feeding device, and rate of delivery indicated by a digit integrator or a chart type recorder.

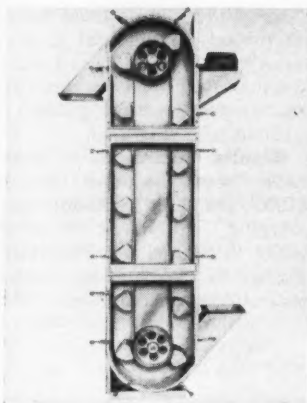
(Controlling weigh belt is product of Proctor & Schwartz, Inc., Seventh St. and Tabor Rd., Philadelphia 20, Pa.)

Check 3430 opposite last page.

Cantilever design of bucket elevator eases cleaning

Uses: Conveying bulk materials from one level to another.

Features: Cantilever design, which permits complete removal of casing covers, pulleys, and belting without dis-



Design of the bulk material conveyor elevator permits quick, easy cleaning

turbing bearings, mechanical seals, or operating machinery, greatly facilitates cleaning of unit.

Description: Bulk material conveyor elevator is available in stainless steel, carbon steel, galvanized steel, or a combination of these materials. Buckets are of smooth, seamless construction. Belting is white food-grade neoprene.

Conveyor elevator is available in five basic sizes. Capacity range of these sizes is from 4 to 40 fpm.

("V" Series Buck-El conveyor elevator is manufactured by the Bucket Elevator Company, 360 Springfield Ave., Summit, New Jersey.)

Check 3431 opposite last page.



RICHARD W. BROWN, Manufacturing Vice President, Seidlitz Paint and Varnish Co., Kansas City, Mo.:
"We're from Missouri—and the Cowles showed us":

Pre-mix with COWLES Dissolver multiplied mill input speed 800%

From a former average of 125 gallons to a new volume of 1000 gallons per man-hour! That's the mill input gain made possible by addition of a Cowles Dissolver pre-mix system. Comparable results can be yours through Cowles-engineered equipment and methods. Cowles' faster, more thorough preparation of your batches can multiply the speed of your entire operation—can increase workers' efficiency. It can greatly increase the output of your other equipment, or save valuable time when used as a reactor.

2½ times the mixing volume—in less space—at less cost

Expect these results in ultimate dispersion, dissolving, emulsifying and deagglomerating—in all processes involving solid-liquid, liquid-liquid and gas-liquid formulas. It's the teeth of the patented Cowles Impeller that give you this spectacular efficiency. And scientifically engineered power and drive systems insure complete control of the impeller action to give you the exclusive Cowles "MULTI-PHASE" mixing action. Cowles engineers will be happy to work with you in adapting the Cowles to your materials, processes and present equipment—and in solving your processing problems economically.

Let us prove it in your plant—at our risk!

It will pay you to take advantage of Cowles free trial installation plan. Write today for complete information and catalog.



MOREHOUSE-COWLES, INC. 1150 San Fernando Road, Los Angeles 65, California

Check 3432 opposite last page

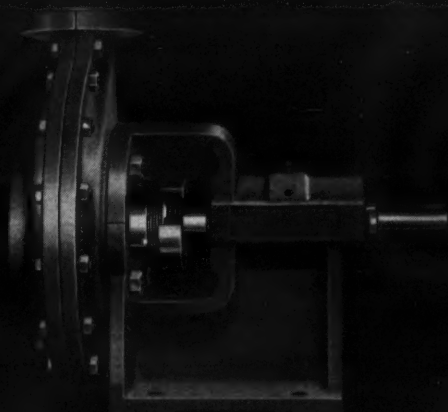


A Cowles Dissolver at work in one of two 500 gal. tanks used for pre-mix prior to milling at Seidlitz plant. When batch is finished, Cowles will swing to second tank.

5808

REPRESENTATIVES IN PRINCIPAL CITIES
Convenient lease and time payment plans

AMPCO[®] ELASTOMER-LINED CENTRIFUGAL PUMPS



THE ONE ECONOMICAL, SAFE, DURABLE PUMP THAT HANDLES HCl

Eight sizes in stock — linings of natural rubber, Neoprene, and Hypalon. See your nearby Ampco Pump Distributor.

Saves you the extra expense of a special pump made from costly or dangerously fragile alloys — to handle muriatic acid — HCl, bleaching agents, mixed acids, cleaning solutions, plating solutions, abrasive slurries, and other destructive media.

Will not affect taste or color, nor introduce impurities into the material being pumped. Resists damage by stray currents in plating baths and from galvanic effects.

Capacities — heads range to 400 GPM and 100' TDH.

Write for free Bulletin P-6.

AMPCO METAL, INC.

Dept. 131-A Milwaukee 46, Wisconsin • West Coast Plant: Burbank, California

P-34

AMPCO[®] SPECIAL ALLOY AND NON-METALLIC CENTRIFUGAL PUMPS

Always depend on  when pumping corrosive media

Check 3433 opposite last page



Titanium tubing saves \$1500 in annual maintenance costs

**New heat exchanger stops
pump problems**

Problem: Breakage in 2" diameter tubing used in a cold water heat exchanger to cool caustic soda, sodium hypochlorite, during chlorination at Kuehne Chemical Co., Elizabeth, N. J., caused four to five-hour shutdowns two to three times monthly.

When shutdowns occurred, three to four men had to be taken off other jobs to change tubing. In addition, hypochlorite was contaminated by cooling water. This required extra processing to remove contaminant.

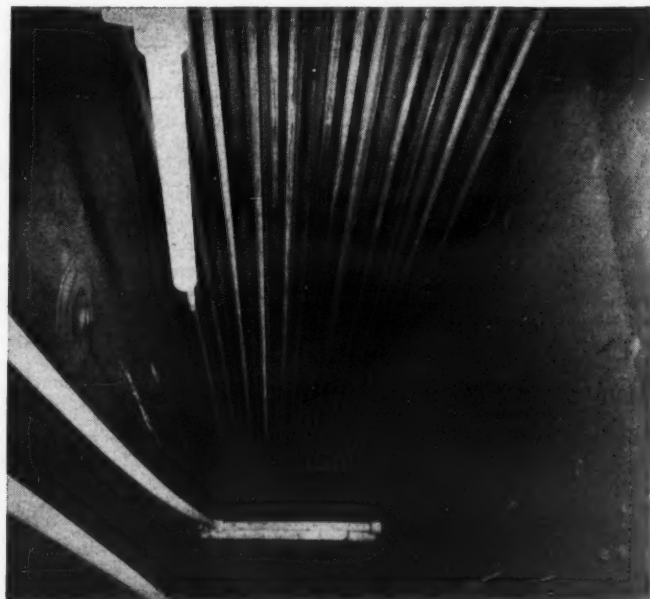
Solution: Welded titanium tubing — 5/8" O.D. x 0.020" — was fabricated into a heat exchanger. Seventy-eight 10-ft lengths of tubing are positioned vertically and sub-

merged directly in each caustic soda processing vat.

Ends of tubing are held in place by plastic end plates which have squeeze rubber gaskets. An externally threaded nut squeezes this gasket against a shoulder, extruding it tightly around tubing.

Since there is no axial force on tubing, slight axial movement from expansion and contraction merely passes through rubber compression gasket without affecting seal.

Results: Maintenance costs have been reduced nearly \$1500 annually without increasing equipment costs. Since there has been no tubing failure in almost two years, output has increased and



Some of the titanium tubing installed in vertical position in caustic soda processing vat. When vat is full, tubing is submerged

CHEMICAL PROCESSING

quality has improved. Time previously spent for maintenance has been converted to production time. Cooling water contamination of sodium hypochlorite has been eliminated.

Under previous cooling method, heat exchanger was separate unit which required pump to transfer highly corrosive fluid from processing vats to cooler. With welded tubing located in processing vats, pump, pump plumbing and maintenance problems connected with them have been eliminated.

(Welded titanium tubing is manufactured by the Alloy Tube Div. of The Carpenter Steel Co., 133 Springfield Rd., Union, N.J.)

Check 3434 opposite last page.

Passes five-year test handling phosphorus

Problem: Valve corrosion in the handling of molten phosphorus at The American Agricultural Chemical Company's Carteret, N. J. plant was a major problem. Corrosion of valve interiors soon made them inoperable, sometimes within a matter of weeks.

Solution: Bronze, lubricated plug valves were installed for the molten phosphorus service. During a five-year test period, the valves handled nearly 40,000 tons of the molten phosphorus materials at a temperature of 76-84°C.

Results: During the five years of handling the molten phosphorus material, valves required practically no maintenance. Operators at The American Agricultural Chemical Company report that there has been no difficulty with valves freezing or sticking. All that is required is an occasional shot of lubricant. A program is now under way at the company to standardize on this type of valve.

(Bronze Rockwell-Nordstrom lubricated plug valve is product of Rockwell Manufacturing Company, 400 North Lexington Avenue, Pittsburgh 8, Pennsylvania.)

Check 3435 opposite last page.

NEW MATERIAL
for your tough
insulating and
refractory jobs



FOAMSIL®

the acid-proof insulating refractory

The photograph above illustrates one critical application in which material failure would be, to say the least, unfortunate. Undoubtedly you have many severe plant or process operations where insulation or refractory failure would be equally unfortunate. It is for just such applications that Pittsburgh Corning has developed its new acid-proof insulating refractory—called FOAMSIL.

FOAMSIL is 99% pure silica expanded to form millions of airtight cells. These cells create excellent insulating value, and since the cells are sealed against moisture, that insulating value remains constant.

Because FOAMSIL is composed of silicon dioxide, it cannot oxidize further—thus withstands high temperatures. It won't react with common acids and has a high melting point. It is incombustible, will not lower the

flash point of hydrocarbons, will not thermal shock and is dimensionally stable. It is easy to cut and fit.

Among potential applications for which FOAMSIL should prove ideal are these: acid-proof tank linings . . . precipitators . . . furnace linings . . . lead acid chambers . . . concentrator towers . . . stack and flue linings . . . reradiating shields . . . environmental test chambers . . . insulation for underground piping. Your own insulating and refractory requirements will undoubtedly suggest a host of other uses for FOAMSIL.

Write today for a free sample of FOAMSIL and complete descriptive literature. Find out how to put this unique new insulating refractory to work to improve your operations. Write Pittsburgh Corning Corp., Dept. CPS-19, One Gateway Center, Pittsburgh 22, Pa.

ACID-PROOF

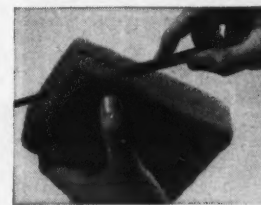
FOAMSIL is ideal for temperature ranges from -450°F to +2200°F continuous. It is available in flat blocks up to 3 inches thick measuring 11" x 17" or 17" x 22" . . . and in various standard or special shapes including internal or external pipe insulation, curved sidewall segments, and fitting covers.



MOISTURE-PROOF



EASY TO WORK



another new product from

P I T T S B U R G H **pc** C O R N I N G

Check 3436 opposite last page

Pump CORROSIVES



of STAINLESS STEEL and TEFLON

(Dupont's trademark for fluorocarbon resins, including tetrafluoroethylene resin).

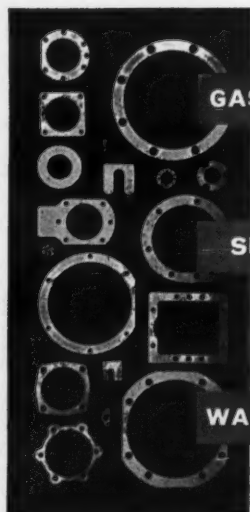
Being used successfully by leading chemical companies. Write for literature.

LOBEE PUMP & MACHINERY CO.,
GASPORT, N.Y.

Since 1899 . . . Noted for Highest Quality Gear Pumps

Check 3437 opposite last page

No Order TOO SMALL... or TOO BIG!



GASKETS

With more than 50 years' accumulation of dies, chances are we can furnish the gaskets, shims, or washers you need

SHIMS

... without a die charge. This can cut your cost and speed delivery—whether you need just a few items or large quantities. Gaskets, shims, washers or special stampings

WASHERS

are available in metallic, non-metallic and plastics to meet your production requirements.

NOW... WIL-PAK
PLASTIC SHIM
STOCK with thick-
ness identified by
color and gauge
number. Write for
Bulletin No. 570.

Write for Catalog
and prices

CHICAGO-WILCOX Mfg. Co.
7717 South Avalon Avenue
Chicago 19, Illinois

Check 3438 opposite last page

CORROSION CONTROL

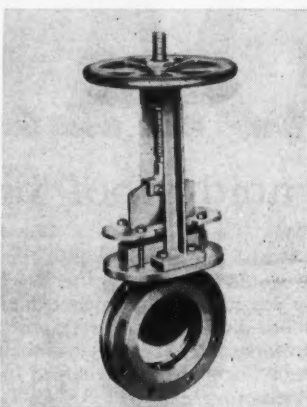
Replaceable valve seat eliminates dewatering

Corrosion-resistant valve has
tight shutoff

Uses: For handling pulp
stocks, slurries, sludges, liq-
uids and gases.

Features: Lightweight unit
has replaceable rubber seat
which is drip-tight both ways.
This eliminates dewatering
problems customary with con-
ventional valve design. Tight
shutoff also permits use as a
wedge gate as well as stock
valve.

Description: Stock valve is
available in stainless steel or



Drip-type replaceable rubber
seat of stock valve permits use
as wedge gate as well

other special corrosion-resist-
ant alloys. Smooth flow design
eliminates all pockets in
which stock might hide out.
Die-formed body permits fast,
easy pipe-line assembly.

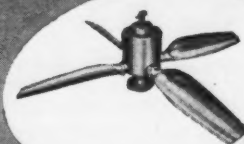
Heavy-duty top flange pre-
vents spread and consequent
packing leakage common to
conventional light valves. Top
flange, yoke, stem, and hand-
wheel assembly are fully
interchangeable with other
valves manufactured by the
company.

Stock valve is available in
wafer, standard, or special di-
mensions. Motor or cylinder
mount for automatic operation
are available at no extra cost.

(Rovalve Fig 17 is product of
W. G. Rovang & Associates,
Inc., 1945 N. Columbia Blvd.,
Portland 17, Ore.)

Check 3439 opposite last page.

for peak
heat exchanger
efficiency



HARTZELL'S NEW CONTROLLABLE PITCH FAN

- holds outlet temperatures to $\pm 1\frac{1}{2}^{\circ}$ F
- cuts power costs by up to 50%
- blade pitch control mechanism responds instantly and automatically to temperature-sensitive control system to match air deliveries to changing atmospheric conditions
- Fan diameters from 84" to 144"; air deliveries to 400,000 CFM (at $\frac{1}{4}$ " static pressure).

For complete details, write for Bulletin A-111.

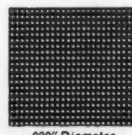
HARTZELL PROPELLER FAN CO.
Div. of Castle Hills Corp.

65 Thomas Blvd., Piqua, Ohio

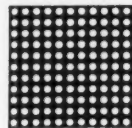
ENGINEERING OFFICES IN PRINCIPAL CITIES

Check 3440 opposite last page

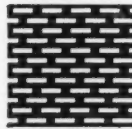
H&K Perforated Screens



.020" Diameter



.045" Diameter



.028" x .125" Slot



No. 3
Diagonal Slot

H&K perforated screens
are furnished, to cus-
tomer order, with holes
accurate and uniform in
size, shape and spacing.
The screen resists blind-
ing as burr-free holes are
slightly larger at the bot-
tom. H&K perforated
screens can be furnished
with margins or unper-
forated areas in prac-
tically any material de-
sired.

H&K specializes in the
perforating of stainless
steel, monel and other
corrosion-resistant al-
loys.

Contact either H&K office
or an H&K agent. Let us
work with you on your
perforated screen re-
quirements.

Write for
H&K
General
Catalog

Chicago Office and Warehouse New York Office and Warehouse
5636 Fillmore St., Chicago 44 110 Liberty St., New York, N. Y.

Check 3441 opposite last page

CHEMICAL PROCESSING

Haul acid safely in rubber-lined steel tank

Uses: Unit is designed for transporting acid around plant.

Features: Mobile, rubber-lined steel tank permits safe, convenient moving of acid.

Description: Steel tank is lined with rubber 3/16" thick. A 35 gpm all-rubber centrifugal pump with carbon seal is



Acid transportation buggy has complete acid-resistant accessories.

provided, as well as an acid-resistant rubber hose. Pump is powered by 1/3 hp motor at 3450 rpm.

(Mobile acid handling unit is product of Perma-Line Rubber Products Corp., 1755 North Winnebago Ave., Chicago 47, Illinois.)

Check 3442 opposite last page.

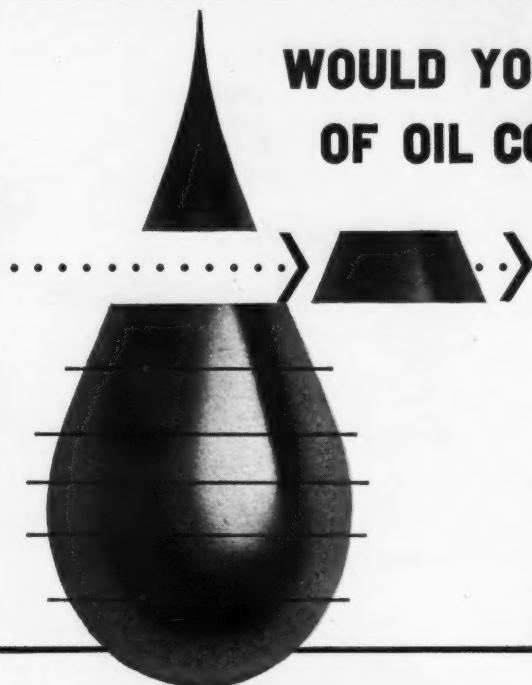


"I keep getting Pat Boone records."

ENGINEERING

NEWS YOU CAN USE ABOUT ENGINE AND COMPRESSOR PERFORMANCE

WOULD YOU BELIEVE THAT ONE DROP OF OIL COULD BE THIS IMPORTANT?



Take a 12 cylinder, 2,000 HP, 330 RPM engine...let just **ONE-EIGHTH OF A DROP** of additional oil per stroke be used in each cylinder and here's what will happen: your oil consumption rate will increase from 8000 BHP hours per gallon to 2000!

And that's the big reason Cook rings save you money. Like other oil control rings, Cook rings meter oil and properly spread it, but Cook rings do this in addition: *they prevent excessive use of oil!*

Don't just get oil wiper rings...get Cook *engineered* conformable oil wiper rings, the most copied oil control rings in the world!

KEEPS PACKING COOL ...AND IT'S LEAK-PROOF!



Cook's new leak-proof packing cup features circulating water completely *inside of the cup itself*... eliminates any possibility of leakage, corrosion or contamination of the material under compression. These are big advantages for all applications—and are naturally of even greater importance on non-lubricated service.

WRITE FOR COOK'S NEW PISTON RING CATALOG

Sixteen-page catalog just off the press. Describes complete line of piston rings manufactured by C. Lee Cook Company, also the special rings of the Airtomics Division. For your free copy, write: C. Lee Cook Company, 932 South 8th Street, Louisville 3, Kentucky.



C. LEE

COOK

COMPANY

Division of Dover Corporation

Rings and Packings Since 1888



Check 3443 opposite last page

CORROSION CONTROL

Helpful tips on PVC sheets and pipe

Rigid or slightly plasticized polyvinyl chloride — in the form of sheet or pipe — is a valuable weapon in the arsenal available for fighting corrosion. Here are some tips on how to make the best use of PVC from a plastics engineer having had long experience with the material in both Europe and the United States. Let us consider sheets and pipe in turn.

PVC Sheets

Extruded PVC sheets are superior to those formed by calendering or molding. High mechanical resistance, fact that they do not delaminate, and long length possible are advantages of the extruded sheets. Tanks lined with extruded PVC sheets have given excellent service for many years. Plasticizer content must be kept low for best results.

Method of welding PVC sheets is important. For plasticized sheets, lap welding method is best — obtaining fusion with hot air and light manual pressure. For rigid sheets, lap welding gives good results in thicknesses up to $\frac{1}{8}$ ". Sheets of greater thickness can be laid close together and then welded with a welding rod.

For lining of tanks, a double system of welding is recommended. First sheets are joined with welding rod as discussed — then a strip of plasticized fused sheet is affixed over the welding line.

PVC Pipe

If PVC pipe is threaded, it is recommended that threaded portion be at least $\frac{1}{8}$ " shorter than seat of coupling. In this way coupling covers a part of pipe that is not threaded and does not expose weakest part.

Use of solvent fittings with solvent cement is an excellent method for joining PVC pipe. This permits speedy installation and provides good mechanical resistance. Also, pipe with thinner walls can be used in many instances — Schedule



It's a good feeling to see
on your **STAINLESS**

PATTERNS AND ALLOYS TO SATISFY MOST INDUSTRIAL NEEDS

For solid reasons, men who ask for the best in Stainless Steel Valves have full confidence when they see the Jenkins Diamond. For almost a century this mark has appeared only on valves made to peak standards of quality in design . . . in castings . . . in machining. JENKINS standards, enforced by the most rigid inspection and testing in the valve industry.

Valves of corrosion resistant stainless steels have been made to those high standards by Jenkins for a quarter of a century. And today, the line of Jenkins Stainless Steel valves includes types and alloys to fully satisfy most service requirements.

They are available through the same leading distributors everywhere who sell Jenkins Valves of Bronze, Iron and Cast Steel.

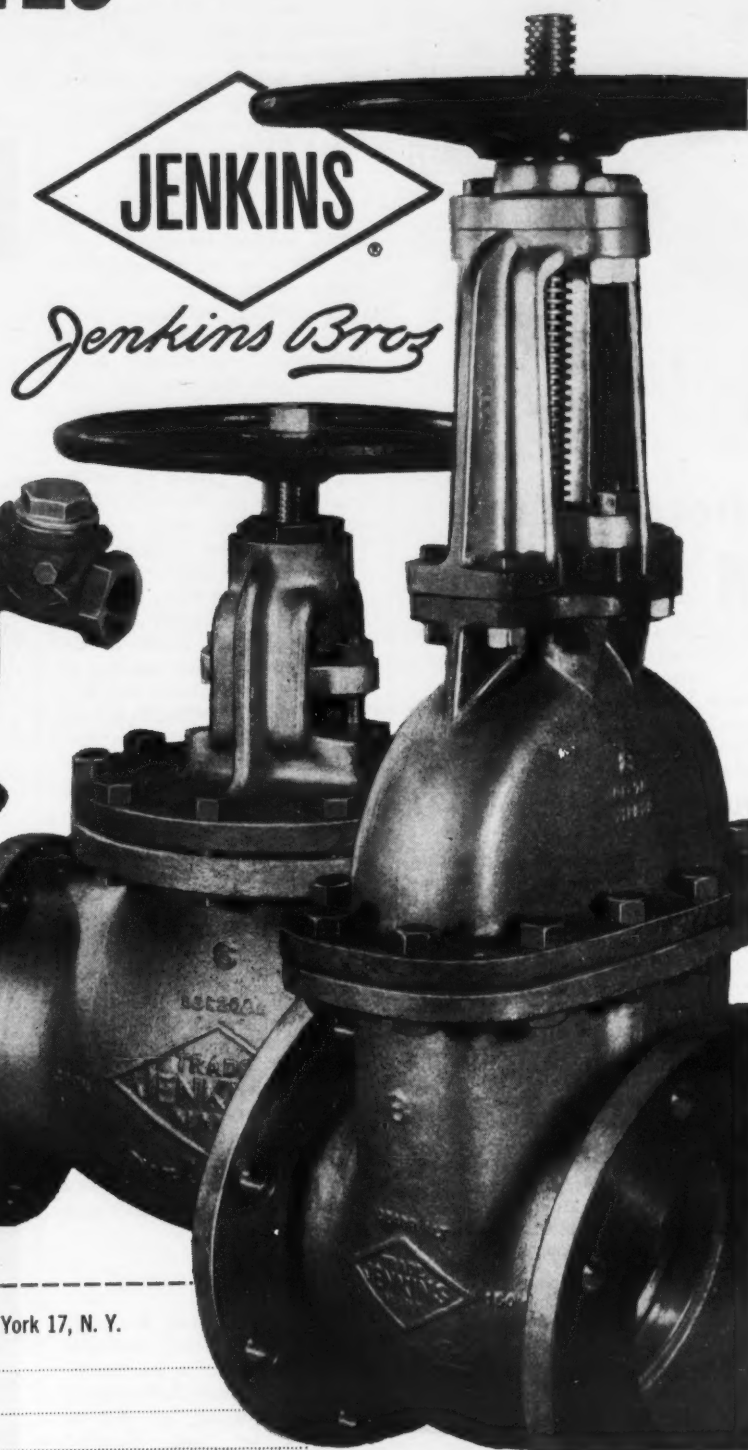
JENKINS VALVES



ee
S

this trusted mark

STEEL VALVES *too*



JENKINS BROS., 100 Park Avenue, New York 17, N. Y.

☐ Send the new stainless steel valve catalog

NAME & TITLE.....

☐ Have a representative call on me

COMPANY.....

ADDRESS.....

Check 3444 opposite last page

CORROSION CONTROL

40 instead of Schedule 80. Also, pipe can be taken apart easily.

Coefficient of expansion or contraction of PVC pipe cannot be calculated exactly since these factors are affected by varying conditions of extrusion. One remedy is molded expansion joints, such as those available from Tube Turns Plastics, which are giving excellent results.

PVC pipe should be supported either with a common angle iron or wooden canal. Pipe installation should not be blocked by its support to avoid hindering normal movement.

(Condensed from technical paper, "PVC — Application — Recommendations and Practical Information on Use in Sheet & Pipe," which was presented at the 1958 Annual Meeting of the National Association of Corrosion Engineers in San Francisco. Paper was prepared by Louis R. Perret, Plastics Engineer, Joseph T. Ryerson & Son, Inc., PO Box 8000-A, Chicago 80, Ill.)

Check 3445 opposite last page.

Flexible plastic pipe offers good strength, low cost

Resists stress cracking

Uses: For handling corrosive fluids.

Features: Material combines superior resistance to stress-cracking with chemical resistance comparable to more expensive materials used for similar purposes.

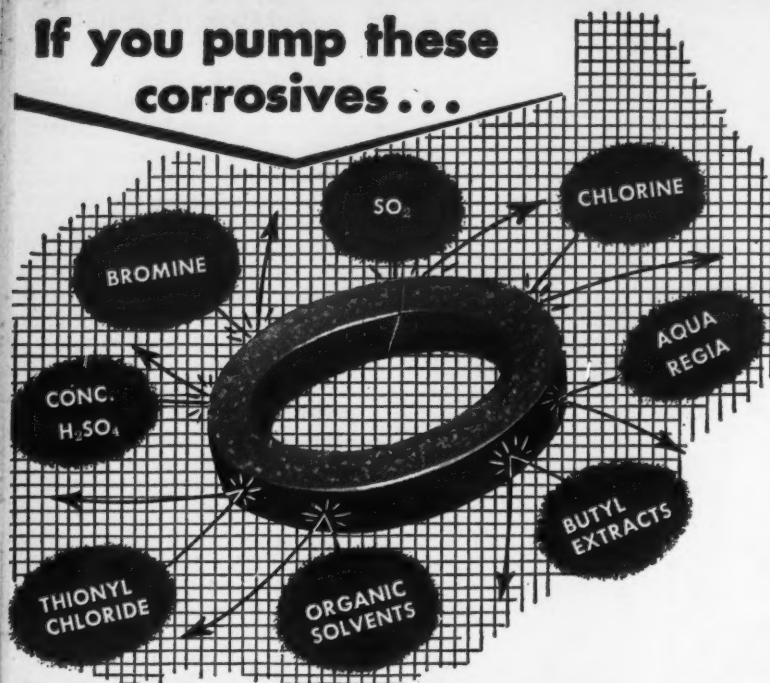
Description: Flexible polyethylene pipe can handle highly corrosive fluids at low pressure under operating pressures as high as 150°F. Pipe is available in 3 to 6" diameters in continuous lengths in folding units up to 500 lb total weight.

Pipe is easily unfolded by applying steam to bends. Coils in sizes ½ through 2" are also available, as well as 30 ft lengths in 3, 4, 6, and 8" sizes.

(Hi-Mol pipe is available from Carlon Products Corp., 10223 Meech Avenue, Cleveland 5, Ohio.)

Check 3446 opposite last page.

**If you pump these
corrosives...**



Get months of Trouble-Free service with CHEMPRO TEFLON PACKINGS

If your pumps and valves handle highly corrosive industrial chemicals, CHEMPRO TEFLON PACKINGS will drastically cut packing replacement and maintenance costs. CHEMPRO Packings last for many months under corrosive conditions which make ordinary packings useless in days or even hours. They stop leakage by providing a tight seal at only slight gland pressure, and their very low coefficient of friction often makes lubrication unnecessary.

TEFLON* PLASTIC STUFFING BOX PACKING

Ideal for either centrifugal or reciprocating pumps operating at speeds up to 3600 R.P.M. handling corrosives at temperatures from -118° F. to 525° F. Style No. 101 composed of 94% shredded Teflon and chemically inert graphite as a friction reducer. Style No. 201 same as No. 101 except that mica is used as friction reducer. Both styles made to fit every size stuffing box on standard process equipment.

TEFLON V-TYPE PACKINGS

For reciprocating pumps and hand, air and motor operated valves handling corrosive materials. Lips of very sensitive pressure rings expand proportionately to increased operating pressure thereby preventing leakage. Suitable for temperatures from -150° F. to 550° F. Unsuitable for centrifugal or rotary pumps. Supplied in bulk or in complete sets to fit specific stuffing boxes.

Chemical & Power Products engineers are packing and gasket specialists with complete fabricating facilities to meet your specific requirements. Write for our complete Teflon Packing and Gasket Catalog.

*du Pont Trademark

CHEMICAL & POWER PRODUCTS, INC.
The Original Fabricators of Teflon Packings and Gaskets

9 Broadway, New York 4, N.Y.

CORROSION CONTROL

**Coal tar-epoxy coating
gives excellent results
for many applications**

A coal tar-epoxy catalyzed coating system, which has been patented, has proved to be an outstanding performer in a variety of applications involving corrosives.

Applications

One highly successful use of the coating, known as Tar-set, has been on the inside of tanks, particularly tank bottoms, and on tank tops. Tanks coated five years ago have not developed leaks despite handling crude oil, gasoline, salt water, dilute acids and alkalis, and other corrosives. In some cases life of tanks having bottoms badly pitted or with small holes was extended several years by using coating along with glass fabric.

Another successful use for the coating has been for protection of structural steel in highly corrosive areas. It has also been used for coating of pipelines, both above and below ground. Coating is excellent for lining of concrete pipe. It has also been used for lining a variety of processing vessels.

Composition

A typical formulation for coating is one consisting of 30% epoxy resin, 25% coal tar, 20% solvent, and 25% pigment. Curing component could be a selected poly-functional amine. Formulation of a coal tar-epoxy coating is a tricky business. This coating was developed only after several years of extensive research work and much testing. Slight changes in formulation can cause loss of desirable characteristics.

Properties of Coating

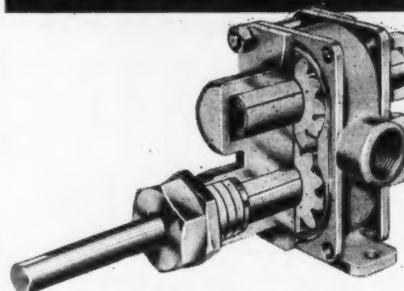
Product has been found to have most of the desirable characteristics of a corrosion-resistant coating. Adhesion is such that coating can only be removed by sand blasting. Temperatures can be withstood from -40 to 300°F

ONLY

\$100.⁰⁰

**FOR AN ECO #316
STAINLESS STEEL**

GEAR PUMP



Available from stock, an ECO 3 GPM SELF-PRIMING GEARCHEM* PUMP with pressures to 100 psi which can handle lubricating and non-lubricating media with maximum efficiency at the lowest cost. These mass produced ECO GearChem Pumps are also available in Carpenter 20 stainless steel, Hastelloy* C and nickel.

For an immediate quotation, call or write the factory.

The ECO GearChem is also available in larger sizes. Write for information.

FREE! PUMP LITERATURE

Additional descriptive information including prices, technical data, curves, service rating and recommendations is available on request. Write today.



*GearChem Trade Mark of Eco Engineering Co.
*Hastelloy Trade Mark of the Union Carbide Co.

ECO
the big name in small pumps
ENGINEERING CO.
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Market 4-6565

Check 3447 opposite last page

Check 3448 opposite last page

CHEMICAL PROCESSING

CORROSION CONTROL

without damage to the coating.

Coating is resistant to fairly strong mineral acids, not including nitric acid. It is resistant to alkaline solutions and is not affected by crude petroleum or petroleum products, even those fairly high in aromatics. Coating is not completely immune to aromatic solvents.

Carefully prepared film indicates that the electrical resistance of coating is quite high. Coating becomes quite hard after exposure, yet retains flexibility.

(Condensed from technical paper, "Coal Tar-Epoxy Resin in Coatings in Industry." Paper was prepared by N. T. Shideler and F. C. Whittier, Research Dept., Protective Coatings Div., Pittsburgh Coke & Chemical Co., Grant Bldg., Pittsburgh 19, Pa.)

Check 3449 opposite last page.

Makes steel resistant to oxidation, abrasion, and corrosion

A process has been developed for providing sheet-metal parts with furnace-bonded protective coating, which resists oxidation, abrasion, and corrosion. Method can impart to mild steel and other low-cost metals oxidation and corrosion resistance usually found only in stainless steels and other high-alloy metals. At the same time, the process provides abrasion resistance said to be better than stainless steel.

The result of more than three years of development work, the process consists of applying a super-thin coating of a special metal alloy to the base metal requiring protection, following fabrication. Alloy is then bonded to base metal by heating to specified temperature under controlled conditions in a pure dry hydrogen atmosphere furnace.

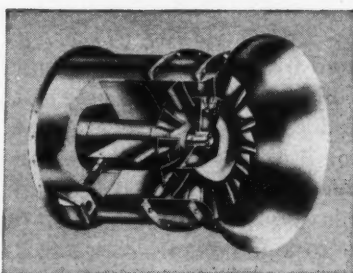
(Microcoat process is development of Stainless Processing Div., Wall Colmonoy Corp., 19345 John R. Street, Detroit 3, Mich.)

Check 3450 opposite last page.



Efficient Joy Axivane Fans vent corrosive fumes from tanks in chemical plant producing fatty acids and polyesters.

CORROSIVE ATMOSPHERE NO PROBLEM FOR THIS JOY AXIVANE® FAN



*Other Bulletins also available:
Compressors 268C-80
Dust Collectors 267D-80*

Joy Axivane Fans are used to vent extremely corrosive fumes in a number of electroplating and chemical plants across the land. Efficient, quiet, compact and durable Joy Axivane Fans are available in alloy steels or with special coatings to resist the most corrosive atmospheres.

Hundreds of standard models are available with either V-belt or integral drive. They are supplemented by a design service which will give you Joy Axivane Fans with whatever efficiency, capacity or pressure your installation requires.

For details write for Joy Fan Bulletin 268F-80.

Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.
In Canada: Joy Manufacturing Company (Canada) Limited; Galt, Ontario.

WSW 17385-268

JOY ... EQUIPMENT FOR INDUSTRIAL PLANTS ... FOR ALL INDUSTRY



**INDUSTRIAL
COMPRESSORS**



**DUST
COLLECTORS**

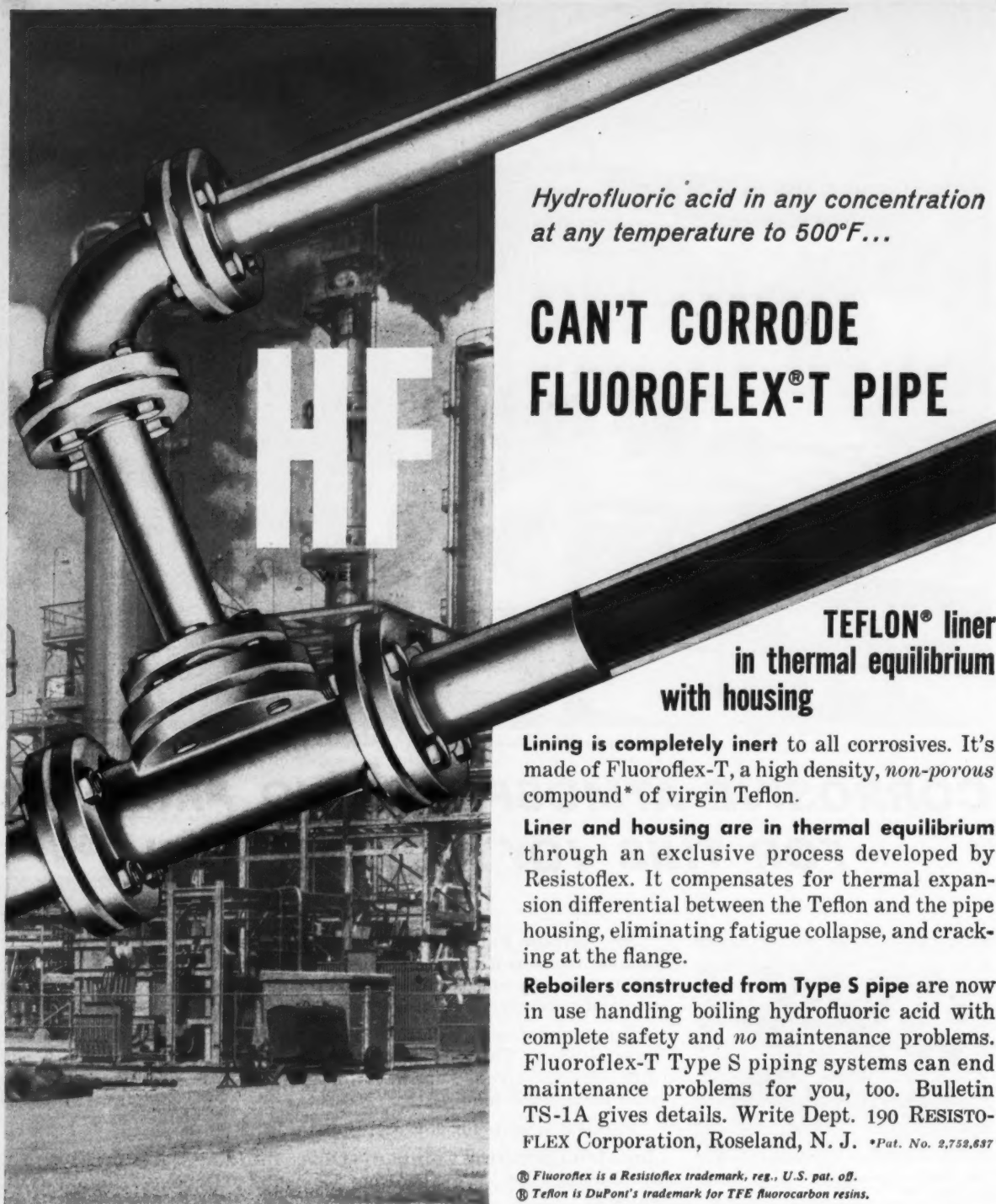


**ELECTRICAL
CONNECTORS**



**FANS AND
BLOWERS**

Check 3451 opposite last page



Hydrofluoric acid in any concentration
at any temperature to 500°F...

CAN'T CORRODE FLUOROFLEX®-T PIPE

TEFLON® liner
in thermal equilibrium
with housing

Lining is completely inert to all corrosives. It's made of Fluoroflex-T, a high density, non-porous compound* of virgin Teflon.

Liner and housing are in thermal equilibrium through an exclusive process developed by Resistoflex. It compensates for thermal expansion differential between the Teflon and the pipe housing, eliminating fatigue collapse, and cracking at the flange.

Reboilers constructed from Type S pipe are now in use handling boiling hydrofluoric acid with complete safety and no maintenance problems. Fluoroflex-T Type S piping systems can end maintenance problems for you, too. Bulletin TS-1A gives details. Write Dept. 190 RESISTOFLEX Corporation, Roseland, N. J. *Pat. No. 2,752,637

® Fluoroflex is a Resistoflex trademark, reg., U.S. pat. off.

® Teflon is DuPont's trademark for TFE fluorocarbon resins.

RESISTOFLEX

Complete systems for corrosive service



LINED STEEL PIPE • FLANGED FLEXIBLE HOSE • BELLOWS • ELBOWS • TEES • REDUCERS • DIP PIPES & SPARGERS • LAMINATED PIPE

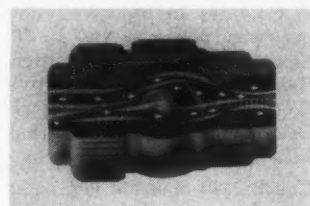
Check 3452 opposite last page

CORROSION CONTROL

**'Seat seals' principle
for high, low pressure
check valve feature**

Uses: For corrosive services.

Features: "Seat seals" for high and low pressures consist of two separate and distinct seats. Low pressure seal was established on less than an ounce of pressure differential and unseats at same pressure level. High pressure "seat seal" is established as pressures increase and finally create solid seat which effectively seals against flow and pressure to ultimate strength



Plastic check valve features two separate and distinct seats for high and low pressures

of valve itself. This high pressure seal will unseat at very low pressure differentials.

Description: All-plastic check valve is available in PVC types I and II, Kralastic, Penton, and Profax. Valve has full flow and low pressure drop, and built-in vibration damper. It can be operated in any position and is available in all standard connectors — thread, socket, flanged, and Victaulic grooved. "Seat seal" is replaceable. Pipe sizes from ½ to 2" are offered.

(Chem-Check valve is product of Chemtrol Company, Lynwood, Calif.)

Check 3453 opposite last page.

Nickel alloy coating process for iron, copper, aluminum, titanium and their alloys without the use of electricity is described and well illustrated in 12-page brochure. One of features is half-page heat treatment curve for the chemical coating. Of interest also is large chart showing corrosion studies of the chemical plating for a wide variety of materials. Tech Bul No. 258 — Kanigen Div., General American Transportation Corp., 135 S. LaSalle St., Chicago 90, Ill.

Check 3454 opposite last page.

- Mixer downtime cut 75%
- Product quality improved

Combination of detachable blade assembly plus mixer's sanitary interior design results in faster, easier, more efficient cleaning between batches

PROBLEM: Too much time was required to clean mixer between runs at Virgin Vinyl Division of Alpha Chemical & Plastics Corporation, Newark, New Jersey. Used for blending small batches of custom compounded PVC formulations, the conventional batch-type unit was continuously subjected to color and quality changes.

Mixer's interior design was such that thorough cleaning was difficult. Even after unit was thought to be clean, there was no absolute assurance that next batch would not pick up some contamination from the previous run. There were too many spots inside mixer where residues could become lodged.

The company supplies vinyl compounds for extruded belting, welting, tubing, bumpers, channels, and similar shapes. Alpha also produces range of vinyls for injection molding in hardnesses between 58 to 98 durometer. Other activities include reclaiming plastic scrap and manufacturing of laboratory controlled re-processed vinyl and polyethylene compounds.

Solution: Company installed an efficient ribbon-type blender having a detachable agitator blade assembly and a smoothly polished sanitary interior surface. Agitator is driven by a variable-speed motor, permitting faster or slower mixing, depending upon material being processed. Controlling the mixing rate

also permits maximum use of mixer capacity, regardless of product consistency.

Unit is jacketed, a basic requirement for processing of vinyls. Automatic switches, together with properly placed thermocouple, provide for quick changing between steam heating and water cooling and result in accurate temperature control.

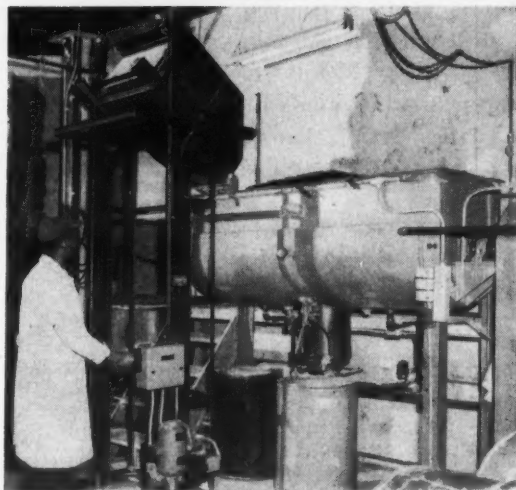
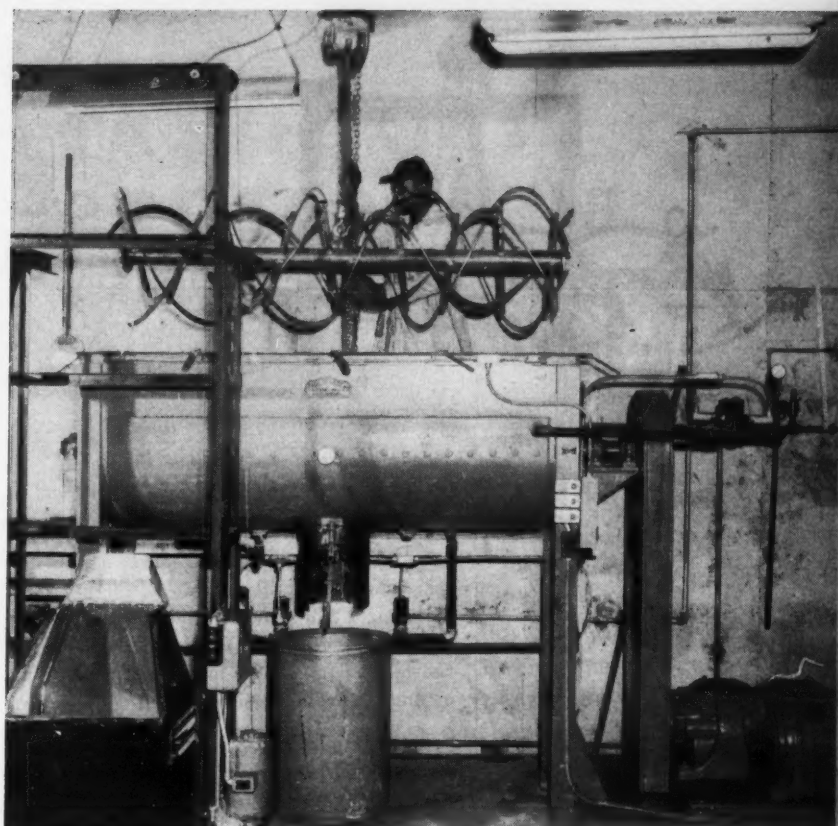
Results: Mixer's efficient design permits unit to be cleaned two to four times faster than previously used machine. Downtime between batches has been cut 75 percent. Blade assembly is detached and removed in matter of minutes, permitting thorough cleaning in minimum time. The blade shaft is equipped with an eye bolt, facilitating easy removal with a hoist (see photo).

Mixer's smooth interior surface has eliminated batch-to-batch contamination problem. Slight additional cost for polishing the bowl was quickly recovered in savings in cleaning time and improved product quality.

In operation, mixer provides thorough blending, while functioning noiselessly and without vibration. Alpha personnel are well pleased with its performance and feel that operations have become easier and more efficient because of it.

(Ribbon-type blender was manufactured by Paul O. Abbé Inc., 239 Center Avenue, Little Falls, New Jersey.)

Check 3455 opposite last page.



▲ Mixer blade assembly is easily detached and quickly removed for separate cleaning

◀ Mixer is charged by means of automatic loader



De BOTHEZAT BIFURCATORS

BYPASS TROUBLE!

DeBothezat Bifurcators for:

CERAMIC KILNS
CHEMICAL PLANTS
CHEMICAL LABORATORIES
CORE BAKING OVENS
DRYING OVENS
DYE HOUSES
ELECTROPLATING TANKS
FOOD PROCESSING OVENS
FOUNDRIES
FURNACES
GLASS PLANTS
LITHOGRAPHIC OVENS
LUMBER DRYING KILNS
METALLURGICAL PLANTS
METAL PICKLING VATS
PAPER MILLS
SLASHERS
STRIPPING TANKS
TEXTILE MILLS

Corrosive fumes and high temperature air never come in contact with a DeBOTHEZAT bifurcator motor.

That means less maintenance time and smoother operation month after month.

For acid atmospheres, DeBOTHEZAT bifurcators offer motor housings of acid-resistant metal alloys or with PVC (plasticized polyvinyl chloride) linings. Fan wheels can also be furnished in acid-resistant metal alloys, hot-dipped PVC or other corrosion-resistant coatings.

Smooth-line exhaust flow eliminates wasteful, sharp-corner deflection. There's less air friction for greater velocity.

The most efficient plant ventilating systems include DeBOTHEZAT bifurcators. Get the full story from a DeBOTHEZAT engineer NOW.



De Bothezat FANS
A DIVISION OF
American Machine and Metals, Inc.
EAST MOLINE, ILLINOIS

IN CANADA: Represented by DOUGLAS ENGINEERING CO., Ltd., Toronto • Montreal

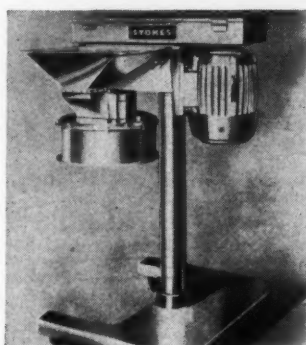
Check 3456 opposite last page

PROCESSING EQUIPMENT

Whirling-blade mill has 360° screen, high capacity

Uses: Grinding, mixing, dispersing, or dissolving dry, sticky, or other difficult-to-handle products in chemical, food, and allied industries. Heat sensitives can also be processed.

Features: Whirling-blade design with 360° screen area permits fast throughput. Particle size is uniformly reduced without excessive fines, and product is thoroughly blended or mixed. Mounted on casters, unit can be easily moved to various parts of plant.



Mill is compact unit mounted on casters for easy moving. Unit shown has 10" diam rotor, 160-sq in screen area

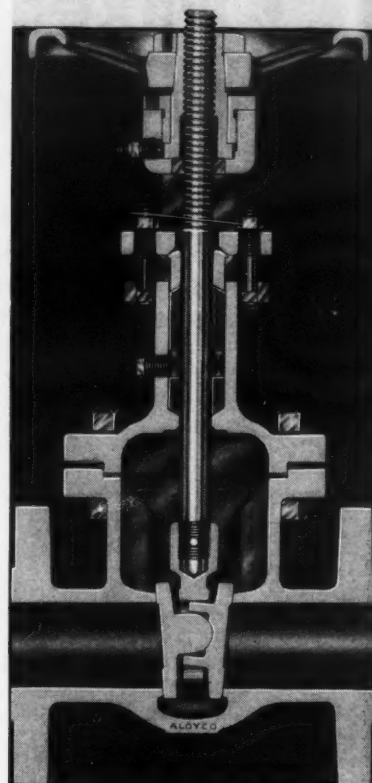
Description: Mill is compact unit, with drive motor and grinding head mounted on cross-beam supported on vertical column. Grinding speed can be varied. Belts are totally enclosed for safety and cleanliness.

Material is ground and mixed by cluster of whirling blades attached to vertical shaft. Blades create a high-velocity, whirling air flow that throws product outward against cylindrical mesh screen which surrounds rotor.

Number of blades and their spacing can be varied to give best results for a given material. From two to 14 blades can be used. Blades can be changed in matter of minutes.

Size of mesh may also be switched according to particle size desired. Both grinding head and screen can be removed quickly and easily for

FOR HIGH-PRESSURE CORROSIVE SERVICE:



300 lb. Alloyco Stainless Steel Gate Valves

Figure 2117
double disc. (above)
Available in sizes 1/2" to 8".
Figure 2217 for
solid wedge.
Sizes 1/2" to 12".
In addition - screwed,
and socket weld ends.
Sizes 1/2" to 2".
Other 300 lb. designs
including globes,

swing and lift checks;
jacketed and tank
valves.
600 lb. designs also
available.

Materials
Types 304 and 304L
Types 316 and 316L
Alloyco 20
Monel and nickel
Hastelloy alloys
B and C

For more information on Alloyco valves for your specific corrosive service, write for Bulletin #7 to Alloy Steel Products Company, 1301 West Elizabeth Ave., Linden, New Jersey...the one manufacturer specializing in Stainless Steel Valves exclusively.

D-3



ALLOY STEEL PRODUCTS COMPANY
Linden, New Jersey

Check 3457 opposite last page
CHEMICAL PROCESSING

PROCESSING EQUIPMENT

rapid cleanup. All parts of mill coming into contact with material being processed are made of stainless steel. Mills are available in three sizes.

Height of unit and vertical flow of material make feeding and removal of product easy and safe. No dust evacuating blowers are required for most materials. Very fine products, prone to dusting, can be handled with help of special fittings to seal bag to outlet of mill.

(Further information about Tornado mill may be obtained from F. J. Stokes Corporation, 5500 Tabor Road, Philadelphia 20, Pennsylvania.)

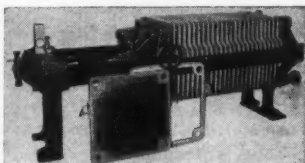
Check 3458 opposite last page.

Polyester plates on filter press

Uses: Filtering various acid or alkaline liquids.

Features: Unit's plates are made of glass-fiber reinforced polyester, reducing filter's initial cost.

Description: Plastic filter presses are available in various sizes. Glass-fiber polyester



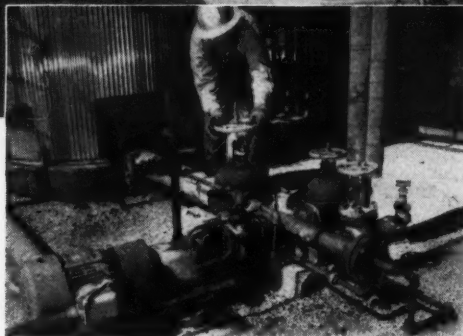
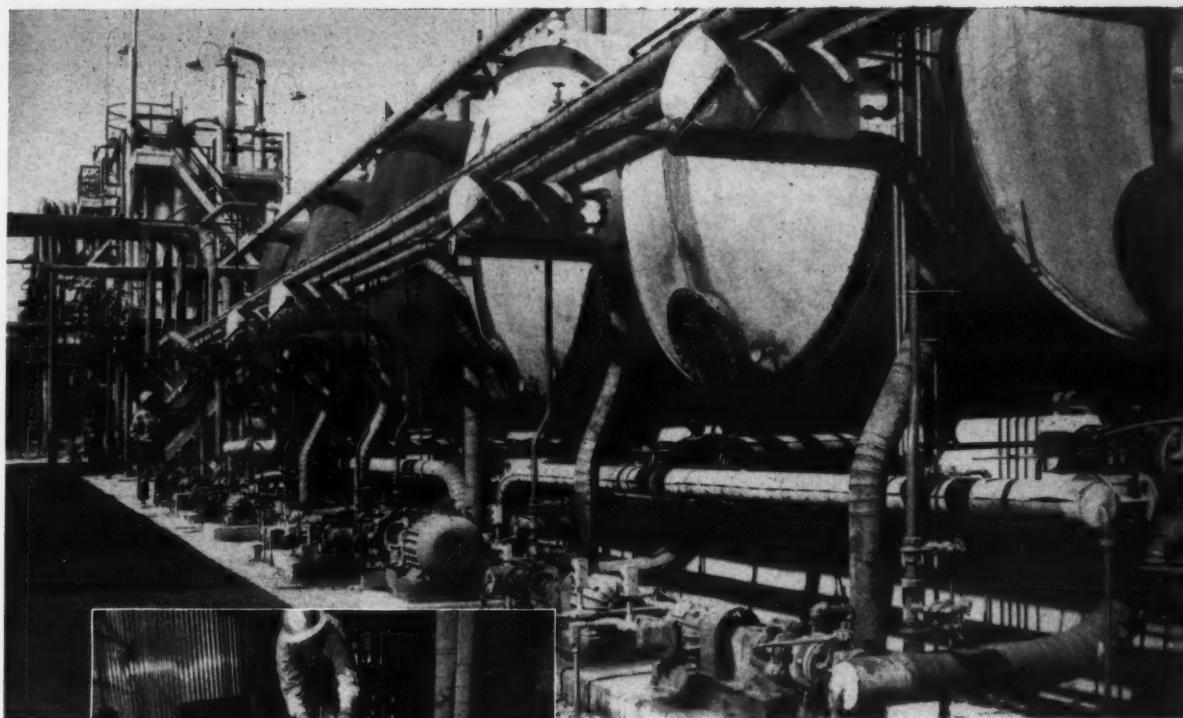
Plastic plates cut initial cost of filter press

plates are as strong as aluminum, weigh less than 1/3 those of cast iron, and cost 1/3 of stainless steel. A 36" square plate withstands 150 psi, remains dimensionally stable throughout wide range of temperatures.

Unit's frames can be supplied in cast iron or aluminum covered with polyvinyl chloride, or other plastic or rubber. They can also be made of stainless steel or other corrosion resistant metals.

(Plastic filter presses are product of T. Shriver & Company, Inc., 808 Hamilton Street, Harrison, New Jersey.)

Check 3459 opposite last page.



La Bour Pumps Make Good on Another Kind of Tough Job

Most of the tasks assigned to La Bour Pumps involve corrosive liquids, suction conditions aggravated by vapors or gases, or solid particles such as crystals or dirt. Sometimes all three appear in one application. But here's a job with none of these problems, yet it took the unique design and capabilities of La Bour to provide a satisfactory solution.

There are 32 La Bour Type DZT

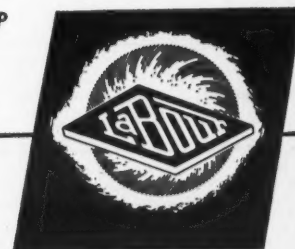
pumps now at work at Bareco Wax Company, Barnsdall, Okla., and 12 others are in process of installation there. They move wax, at temperatures above 200° F., through all stages of manufacture. Pumps and lines are steam-jacketed throughout.

Whatever your problem in handling process liquids, corrosive or otherwise, it will pay you to get in touch with La Bour.

ORIGINAL MANUFACTURERS OF THE SELF PRIMING CENTRIFUGAL PUMP

LABOUR

THE LABOUR COMPANY, INC. • ELKHART, INDIANA, U. S. A.



Check 3460 opposite last page

jamesbury

Double-Value

"Double-Seal"™ Ball Valves



Double EFFICIENCY

In the high pressure water service installation shown here, and wherever the Jamesbury "Double-Seal" principal is employed, there is double the efficiency of performance.

In Pipe Sizes 1/4" to 8" for:

High-Pressure service
High-Vacuum service
Handling of hazardous fluids
Cryogenic operations

Distributors In Principal Cities Get The Complete Facts On The Jamesbury "Ball Valve" Principal.



694-8

Name _____ Title _____

Company _____

Address _____

City _____ State _____

☐ Jamesbury Literature
☐ Distributor Service

JAMESBURY CORP., 65 NEW STREET, WORCESTER, MASS.

Check 3461 opposite last page

PROCESSING EQUIPMENT

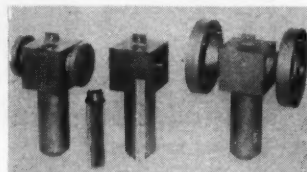
**Stainless steel filters
withstand 5000 psi,
temperatures to 500°F**

Units can be cleaned, reused

Uses: For handling gases, liquids or fuels, filters will move such materials as nitrogen, helium, oxygen and air at flow rates up to 20,000 scfm at pressures of up to 5000 psi. Liquids such as water and hydraulic oil can be filtered at flows up to 150 gpm.

Features: Filter element is stainless steel Poromesh sintered-wire, porous metal filter of corrugated sleeve type which with silver-soldered joints, will withstand temperatures up to 500°F. Elements can be cleaned and re-used indefinitely. Pore sizes range from five to 250 microns.

Description: Head and bowl of filters are stressed for both 3000 and 5000 psi systems with 4:1 safety factors on burst. They are designed to achieve maximum application flexibility at minimum cost. One



Heavy-duty filters withstand high pressures, can handle gases, liquids

basic design utilizing an interchangeable element can be supplied with different flange sizes, NPT or AND ports, thereby facilitating applications to variety of systems.

Units are available in 12 standard designs having variety of NPT, AND 10050 ports as well as RTJ weld neck flanges. Overall dimensions range from 6 1/2" long by 16 3/8" deep to 16 1/4" long to 20 7/16" deep. Other flange or port sizes are made to customer's specifications.

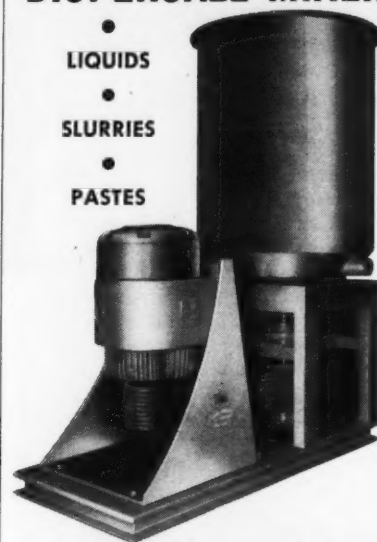
(Bendix Heavy-Duty In-Line "T" Filters are available from Bendix Filter Div., Bendix Aviation Corporation, 434 W. 12 Mile Rd., Madison Heights, Michigan.)

Check 3462 opposite last page.



abbe' DISPERSALL MIXER

LIQUIDS
•
SLURRIES
•
PASTES



The Abbé Dispersall Mixer disperses, mills and blends (as well as emulsifies) in ONE operation. Solid ingredients are completely dispersed in a fraction of the time required by conventional mixers. Eliminates pre-milling and pre-mixing.

The Abbé Dispersall Mixer gives you speed and power, plus the tremendous advantage of easy cleaning in changing from one product to another. Tooth pastes, ointments, paints, colors and pharmaceuticals, etc., are mixed and dispersed better and faster in the Abbé Dispersall Mixer in a ONE-stage operation. Write for Catalog 78.

Address Dept. 46

abbe' ENGINEERING CO.

420 Lexington Ave., New York 17, N. Y.
Designers and Manufacturers of
Ball, Pebble and Jar Mills • Pulverizers
Sifters • Cutters • Mixers

Check 3463 opposite last page

CHEMICAL PROCESSING

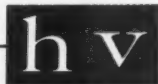
IN THE SPOTS THAT COUNT...

Goodyear specifies Homestead Valves for non-contamination of GR-S latex rubber

Through the round ports of Homestead Lubricated Plug Valves at Goodyear Tire and Rubber Company's synthetic rubber plant in Houston, Texas, flow dilute solutions of GR-S latex rubber at 80 p.s.i. and 100° F.

Fluid solutions never lodge and build up in the line since Homestead Round Port Valves provide full circular opening through plug and body of the valve—same size as the pipe they serve.

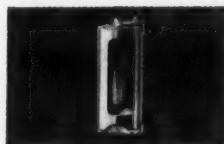
A letter or the coupon below will bring you further information on this installation. You may also receive complete details on low first cost, low maintenance, Homestead Valves in our catalog 39-1.



HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. Box 140, Coraopolis, Pennsylvania

Check 3464 opposite last page



Controlled pressurized lubrication plus extremely close tolerances between plug and body assure lubrication of all sealing surfaces without contamination of line fluids.

- ☐ Please send me catalog and prices on Homestead Lubricated Plug Valves.
☐ Send more facts about latex applications.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....

PROCESSING EQUIPMENT

**Over 95% efficiency
for compact classifier
with no moving parts**

Operates by precise control
of air velocities

Uses: Classifying various
materials in 74 to 297 micron
range.

Features: Machine has no
moving parts, needs virtually
no maintenance, and has low
power requirements. Classify-
ing efficiency is over 95 per-
cent. Unit occupies small



Classifier is compact, a 30-ton
per hr unit occupying no more
floor space than an office desk

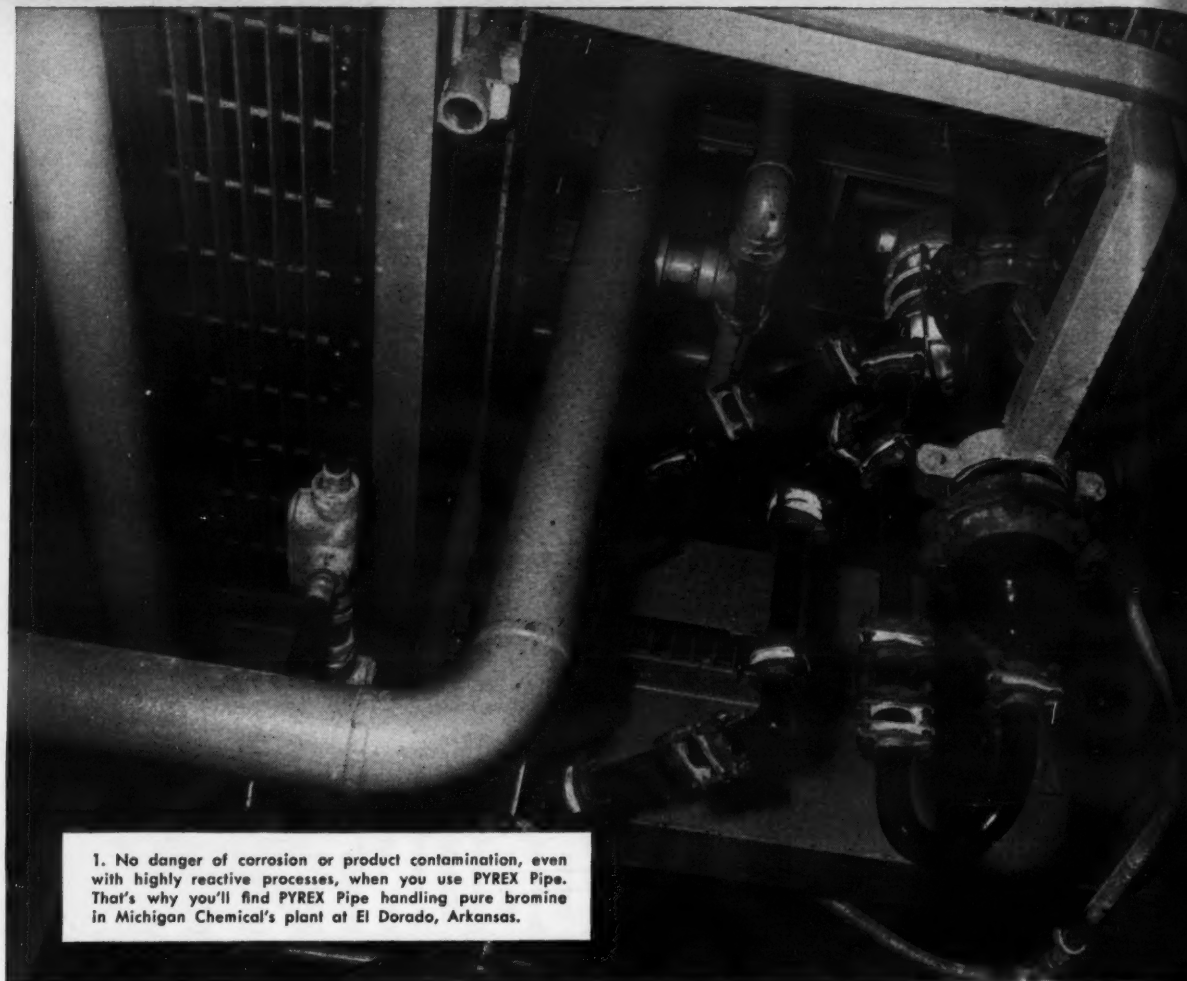
space, a 30-ton per hr model
requiring no more area than
an office desk.

Description: Classifier op-
erates on hitherto unused
combinations of aerodynamic
forces. Air or gas entrained
feed material enters classifier
through inlet at top, cascading
downward past set of in-
clined vanes through which
air and entrained fines are
drawn off.

By controlling velocities of
inlet air and vane exhaust air,
gravitational, inertial, cen-
trifugal, and drag forces are
caused to act on particles in
such a manner that those be-
low given size will be drawn
off through vanes. Particles
above this size continue down-
ward.

Secondary air supply intro-
duced below vanes crosses
stream of coarse particles,
scrubs away any adhered
fines, and circulates into clas-
sifier chamber, exhausting
through vanes.

This provides means of con-
trolling inlet air velocity and
also acts along with primary-



1. No danger of corrosion or product contamination, even
with highly reactive processes, when you use PYREX Pipe.
That's why you'll find PYREX Pipe handling pure bromine
in Michigan Chemical's plant at El Dorado, Arkansas.

A lot of bromine means a lot of glass

Michigan Chemical depends upon PYREX®

You would hardly attempt to make bromine in the lab-
oratory in anything but glass—and probably glass bearing
the PYREX trademark.

Naturally enough, when Michigan Chemical Corpora-
tion built its new El Dorado, Arkansas, plant, in coopera-
tion with the Murphy Corporation, a lot of PYREX Pipe
footage was installed.

Much of the glass pipe is used to deliver bromine from
the Kubierschky extraction towers. The rest is used to
handle hot acidified brine and ethylene bromide.

If you have ever had anything to do with the manu-
facture of bromine—or with any such corrosive process—
you know what Mr. Clayton Carter, Plant Manager,
means when he says, "PYREX Pipe is one of the few ma-
terials we have found that will withstand the extreme
corrosion."

Not only is PYREX Pipe easy to keep in service—even
under these rugged conditions—it is easy to put in service.

Your Own Men Can Install PYREX Pipe

PYREX Pipe is no more difficult to install than any other
piping. For one thing, it's lighter, easier to handle, takes
fewer hangers. There are no expansion joints, no lead
pouring. All that is needed is a wrench and a good strong
right arm. It doesn't have to be babied.

And PYREX Pipe Costs Less

PYREX Pipe is rugged. It's chemically inert. It withstands
extremes of thermal shock. Add these up and you have
the reasons a PYREX Pipe installation costs so little—
just because it lasts so long.

Get the Facts

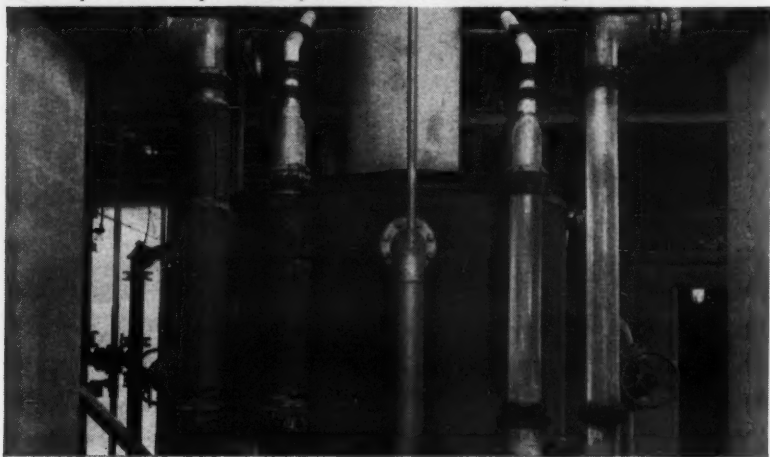
The best way to get the facts about what PYREX Pipe can
do for you is to try it out yourself in your plant. Just ask
us about making a test installation.

For all the facts on application, design, and installa-
tion, send for a free copy of Bulletin PE-3. Fill out the
coupon and you'll hear from us promptly.



2. You can use PYREX Pipe outdoors, too, even where ambient temperatures differ widely from those of fluids handled.

3. You can keep constant visual check on flow because PYREX Pipe is transparent. This lets you see blockage, or other problems, before extensive damage is done.



Pipe to safeguard its bromine output

HOW MANY TIMES

have you seen materials being tested for corrosion resistance? Chances are the materials for testing and the acid used were placed in PYREX glassware. And after the tests were completed, the glassware was still intact, no matter how badly eaten away the test materials were. Doesn't that suggest to you that PYREX Pipe is the ideal material for handling corrosive fluids?



CORNING MEANS RESEARCH IN GLASS

CORNING GLASS WORKS

3 Crystal Street

Corning, New York

Please send me the PYREX Pipe manual, Bulletin PE-3.

Name.....Title.....

Company.....

Street.....

City.....Zone.....State.....

Check 3465 opposite last page

PROCESSING EQUIPMENT

air eddy currents as moving wall which contains curtain of feed material within classification zone without detrimental frictional drag forces of a fixed wall.

By regulating secondary air flow and maintaining constant exhaust air velocity, primary inlet velocity is regulated and the various aerodynamic forces are controlled to separate fines smaller than required diameter.

Classifier operates at wide range of temperatures. Unit may be adapted to most plant layouts. It is available in sizes handling from 100 lb to 100 tons material per hr. Once machine is set for given operating condition, it requires no further attention.

(Gravitational-inertial classifier is product of Buell Engineering Co., Inc., 123 William Street, New York, New York.)

Check 3466 opposite last page.



King-size finned tubes

... measuring 6" OD, are now available in heat exchangers. The fins, which can boost heat transfer surface up to 10 times the bare tube area, range in height from $\frac{3}{4}$ " to $1\frac{1}{4}$ ". They can be made to withstand up to 5000 psi and 1150°F. Pint-size tube (at bottom of photo) has $\frac{3}{16}$ " OD. Fin height is only $\frac{3}{32}$ ".

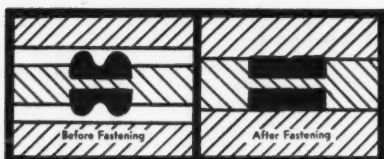
(Further information about finned-tube heat exchangers may be obtained from The Griscom-Russell Company, Massillon, Ohio.)

Check 3467 opp. last page.

DO YOU KNOW ABOUT GASK-O-SEAL?



The static seal that can not blow out!



The above diagram is "typical" only. Gask-O-Seals are also made with one-side seals.

If you do not know about Gask-O-Seals look at these facts:

- ✓ Gask-O-Seals will seal practically any processable fluid . . .
- ✓ Gask-O-Seals can be re-used . . .
- ✓ Gask-O-Seals will seal at low or high pressures, vacuum or positive . . .
- ✓ Gask-O-Seals are available as standards and as specials in almost any configuration or to meet special requirements.

They are recommended for flanges, gear boxes, transfer cases . . . any place where truly efficient static seals are needed.

Note: A recent development of the Gask-O-Seal principle indicates effective sealing in the temperature ranges of -400° to +1000° for specific applications.



Parker SEAL COMPANY

CULVER CITY, CALIF. • CLEVELAND, 12, OHIO
A DIVISION OF Parker-Hannifin CORPORATION

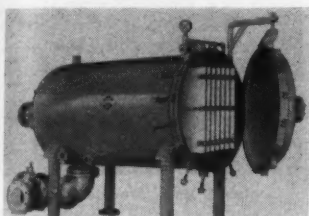
Check 3468 opposite last page

Plates are rolled out for easy inspection on filter

Uses: Producing water of zero turbidity.

Features: Filter plates are hung from roller carriages for easy inspection and removal.

Description: Diatomite water filter is slurry fed and uses



Plates on filter are hung on roller carriages

synthetic cloth covered filter plates to remove sediment and organic matter. Unit has built-in jet spray for flushing. Plates join self-sealing manifold openings and seal without bolts or fastenings.

(Model RJ water filter is product of Sparkler Manufacturing Co., Mundelein, Illinois.)

Check 3469 opposite last page.

Generator system makes 99.5% pure liquid nitrogen

Only pushbutton start and stop is required

Uses: Generator system provides complete nitrogen liquefying facility economical for users having moderate demands for liquid nitrogen.

Features: Only pushbutton start and stop required. Up to 95 liters daily of 99.5 percent pure liquid nitrogen are provided. Equipment consists of column, gas liquefier and 200-liter storage tank.

Description: Nitrogen column blower supplies oil-free air at slight positive pressure. Water vapor and carbon dioxide are frozen out in heat exchanger. Air is rectified in packed column, and nitrogen gas is passed from top of column to modified condensing

To next page

Maintenance and Steam Traps

... there's a relationship that goes far beyond trap maintenance alone

Good traps and good trapping have a greater effect on your maintenance costs than does trap maintenance itself. By that we mean that the right traps, properly selected and installed, and with the benefits of a preventive maintenance program, will save far more maintenance dollars than they will cost.

Under the pressure of spiralling maintenance costs, this thought becomes mighty important. Let's take a look at what it involves:

Proper Selection of Steam Traps

1. Be sure it's the right type of trap.
2. Be sure it's sized right and is for the correct operating pressure.
3. Be sure it's first rate in design and construction.

Proper Installation of Steam Traps

1. Install them so they are accessible for inspection and maintenance.
2. Install a test valve.
3. Use a union or unions.
4. Use a shutoff valve or valves.
5. Use a strainer ahead of the trap if dirt conditions are bad.
6. Use a by-pass only where continuity of service is imperative.
7. Standardize inlet and outlet connections.

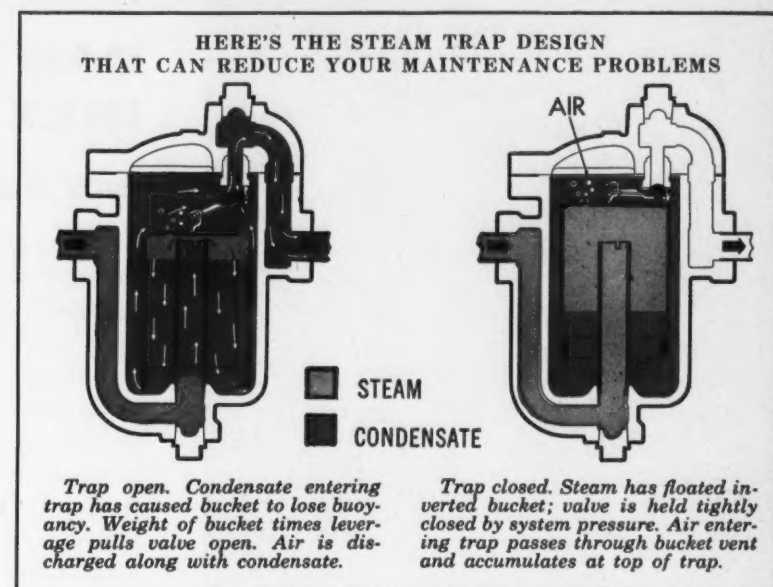
Preventive Maintenance Program

1. Test trap regularly for proper operation. (Trap size, operating pressure and importance determine frequency.)
2. Inspect internal mechanism at least once a year.

You Get Indirect Benefits As Well

The direct benefits of the plan outlined are pretty obvious — good traps, properly selected, require less maintenance ... testing and inspection prevents troubles that lead to maintenance.

However, this plan provides indirect benefits which reduce maintenance in other parts of the plant as well:



burning equipment and on ash handling equipment.

Good traps protect the system by eliminating water hammer and preventing the damage it can do.

Good traps discharge carbon dioxide before it can go into solution to form corrosive carbonic acid — less corrosion, less maintenance.

Good traps increase production to reduce the length of time equipment must operate or reduce the amount of equipment needed ... either way maintenance is reduced.

How to Go About It (The Sales Pitch)

We admit we're prejudiced, but we don't think there is any better way to select steam traps than with the help of the 44 page Armstrong Steam Trap Book. Here in a single source is specific data on the selection and sizing of traps, how to install them for best results, and how to maintain them most economically.

The Steam Trap Book will also give you full information on the design and construction of Armstrong Inverted Bucket Steam Traps that offer these important maintenance-reducing advantages:

1. Armstrong Traps are dependable.

2. Armstrong Traps require no adjustments — go from full load to zero load automatically.

3. Armstrong Traps are self-scrubbing—ordinary dirt conditions can't hurt them.

4. Armstrong Traps have long-life parts — valve and seat are heat treated chrome steel — lever assembly and bucket are stainless steel.

5. Armstrong Traps have water sealed valves to minimize wire drawing and erosion.

Ask for your copy of the Steam Trap Book—there is no obligation. Then test Armstrong Trapping. If you are not completely satisfied with the results, you can return the traps for a full refund of the purchase price. You can't lose much that way. Call your local Armstrong Representative or Distributor, or write

Armstrong Machine Works
8804 Maple Street
Three Rivers, Michigan



ARMSTRONG
STEAM TRAPS

Check 3470 opposite last page

LIQUID

METERING

**CAN BE SIMPLE,
INEXPENSIVE . . .**

and Save You Money!

Perhaps you've felt the need to meter your industrial liquids but have hesitated because you feared metering was costly or complicated. Actually, even a plant-wide installation of simple, direct reading Rockwell meters can be made very easily and for a nominal investment. They will pay their way many times over by providing realistic records for cost, inventory and utilization controls.

Measure Even Corrosive Liquids. Among the many types of Rockwell meters, there is the right design to measure most anything that flows . . . including *all stainless-steel meters* for corrosive liquids.

If you blend, batch or package liquids, Rockwell meter accessories such as automatic shut-off controls, impulse counters and remote registration will cut your costs and increase production. Use the coupon for full details.

INDUSTRIAL METERS

another fine product by

ROCKWELL

CLIP COUPON—MAIL TODAY

ROCKWELL MANUFACTURING CO.
Pittsburgh 8, Pa.

Gentlemen

I am interested in measuring _____

(Name of Liquid)

Pipe Size _____

Working Pressure _____ psi

Temperature _____ °F max.

Max. Flow Rate _____ gpm

Min. Flow Rate _____ gpm

Your Name _____

Company _____

Street _____

City _____

Zone _____

State _____

PROCESSING EQUIPMENT

(Continued from preceding page)
head of liquefier.

High-purity nitrogen is liquefied, and non-condensable gases are continuously bled



Compact unit provides up to 95 liters of liquid nitrogen per day

off. Portion of liquid is used as reflux to cool column; rest is drawn off as product to storage tank or transfer Dewar.

(ADL Liquid Nitrogen Generator System is manufactured by Arthur D. Little, Inc., 20 Acorn Park, Cambridge 40, Massachusetts.)

Check 3472 opposite last page.

Filters all meet ASME standard

According to announcement made by manufacturer, all pressure-leaf and plate filters now produced by company meet ASME code standard requirements. While buyers have option of requesting addition of ASME inspection plate, there are no differences in design, fabrication, or materials used in National Board inspected filters and those supplied without the certifying plate.

In each case, the same tests of double normal operating pressures are also made. In specifying that ASME plate is affixed, buyer assumes only the additional cost of the National Board inspections.

(Filters are manufactured by Niagara Filters Div., American Machine and Metals, Inc., East Moline, Ill.)

Check 3473 opposite last page.

Check 3471 opposite last page

CHEMICAL PROCESSING

THAT'S INTERESTING

How's your tear control?

West Coast researchers on smog effects are looking for cry babies with especial control over their tear ducts. Researchers have found, among other things, that tears shed over a lost love or a hammered left thumb are quite different from those caused by peeling an onion. What's in a tear? Chemical make-up is 98.2% water. (Kaiser Builder, Kaiser Engineers Div. of Henry J. Kaiser Company)

New detector sees infrared

An ultra-sensitive detector that can respond to less than one-twentieth of a billionth of a watt of infrared radiation has been developed by scientists at Westinghouse Research Laboratories. Function is to convert invisible infrared radiation into electrical signals that can be amplified and seen.

For more information on product at right, specify 3474 see information request blank opposite last page.



For tested generator performance . . .

Come to Kemp



At Gulf Oil's Port Arthur, Texas refinery, purging inerts are supplied by Kemp Generator and Kemp Dryer working as a team. The units produce 30,000 SCFH for a bountiful and easily controlled supply at low cost.

Tested . . . and proved! Factory tested with rigid component checks, field tested by Kemp engineers at installation, and time tested by years of actual use. Proved that Kemp Inert Gas Generators are built to last, built to produce, built to be accurate.

At the heart of every Kemp Generator is the Kemp Industrial Carburetor, uncomplicated in concept, yet outstanding in performance. It provides sensitive and accurate control of inert analysis. A quick setting of the calibrated dial insures delivery of an unvarying mixture, regardless of line demands.

And Kemp design—rugged, simple, and sturdy—means that maintenance and attendance requirements are kept to a bare minimum. Kemp Inert Gas Generators stand up under the toughest conditions, yet produce with complete dependability.



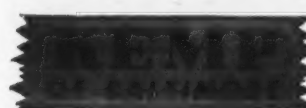
To get detailed information and ideas, give your Kemp Representative a call. Or write us direct for Bulletin I-10. THE C. M. KEMP MFG. Co., 405 East Oliver St., Baltimore 2, Maryland.



Convection Dryers



Atmos Generators

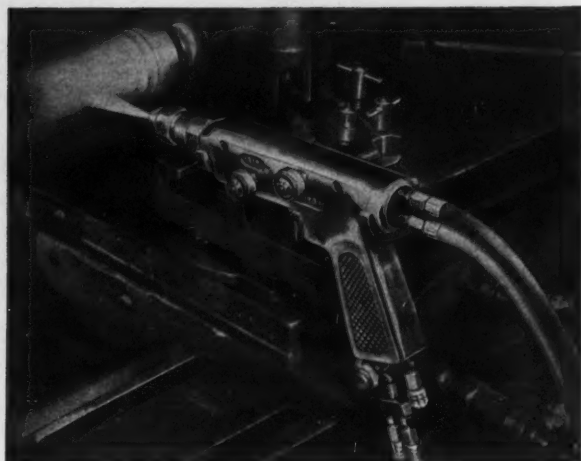


Nitrogen Generators



Oried Dryers

STOP CORROSION

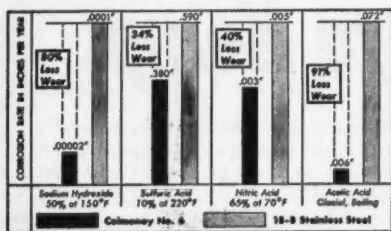


with Colmonoy Spraywelding

The superior corrosion resistance of Colmonoy No. 6 alloy makes it the ideal hard-facing material for use on surfaces undergoing metal-to-metal wear under corrosive conditions, such as pump and valve parts.

The Colmonoy Spraywelder puts No. 6 on fast, in powder form. It makes smooth overlays within .010" of desired size, requiring a minimum of finishing. Sprayweld overlays are solid and welded to the base metal.

The corrosion of vital process equipment parts becomes needless waste when the wear resistant qualities of Colmonoy No. 6 are combined with the economy and ease of the Spraywelder.



This table shows the comparative resistance to corrosion of Colmonoy No. 6 and 18-8 stainless steel. No. 6 is resistant to almost all caustics and acids. Ask for Engineering Data Sheet No. 3.



WRITE RIGHT NOW

For the Colmonoy Spraywelder Catalog and Hard-Facing Manual No. 79

HARD-SURFACING AND BRAZING ALLOYS

WALL COLMONOY
CORPORATION
19345 John R Street • Detroit 3, Michigan

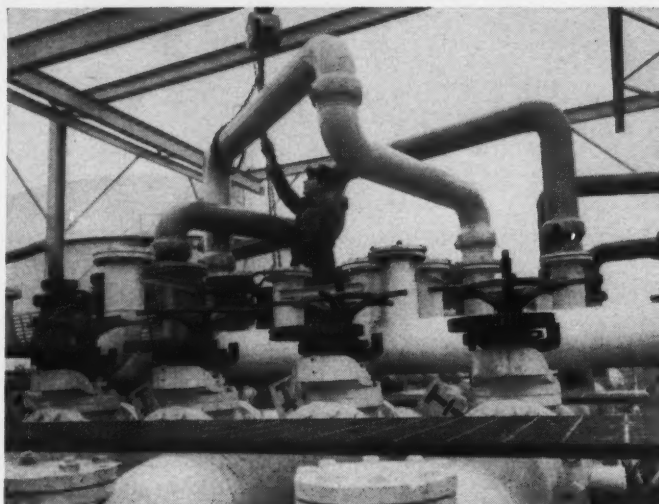
BIRMINGHAM • BUFFALO • CHICAGO • HOUSTON • LOS ANGELES
MORRISVILLE, PA. • NEW YORK • PITTSBURGH • MONTREAL • GREAT BRITAIN

Check 3475 opposite last page



PLANT ENGINEERING MAINTENANCE & SAFETY

... electrical & mechanical developments



Flexibility of system permits transfer of products without danger of cross contamination

Swivel joint jumper system can be easily handled by one man



Volume fuel transfer with 'jumper' using swivel joints

System shunts feed flow to desired storage tank without danger of cross contamination of products. It can be easily managed by one man.

THEODORE W. WETT, Associate Editor
with **RICHARD W. BOGAN**
Supt. General American Tank Storage
Terminals Div.

General American Transportation Corporation
Argo, Illinois

Problem: Large quantities of differing liquids must be transferred from barges to storage at General American Transportation's Argo, Illinois terminal. Material is pumped from barge to any one of 13 storage tanks.

A closed system was not practical because of possibility of leakage and cross contamination of products. Also, in a

closed system, it would be easy to open the wrong valve and mix products by accident.

In a typical instance, regular gasoline, premium gasoline, range oil, and #2 oil are transferred through four separate delivery lines into the appropriate storage tank. Products are pumped at the rate of 1000-2500 barrels/hr.

Solution: To handle large volume fuel transfer, company installed a "jumper" system utilizing swivel joints for flexibility. Jumper connects feed line to tank. Each jumper consists of 3 swivel joints, 2 on each end and 1 in the center to form a flexible piping system (see photos). Lines are 10" mild steel. Connections are made with 8"-diam flanges using 4 bolts.

Joints are mild steel, cast units. Packing is aromatic-resistant molded Hycar. Material is molded around a brass ring which imparts structural strength and rigidity.

Results: Swivel-joint jumper system eliminates any possibility of cross contamination. Accessory scaffolding and hoists make it possible for one man to easily change jumper from line to line. Piping changes are made on the average of 5 times a week.

In addition to barge shipments, company will soon receive material directly through a pipe line. Material will be handled at a rate of approximately 5000 barrels/hr.

(Jumper system was supplied by Chiksan Co., a Subs. of Food Machinery & Chemical Corp., Brea, Calif.)

Check 3476 opposite last page.

Flexible neoprene hose can be crushed without damage

Uses: As flexible duct for exhausting fumes, vapors, dust, and mists; flexible hose for low pressure conveying of powdered materials; and flexible connections on machinery for handling air or gases.

Features: Designed to possess high durability for long service life, hose can be crushed without damage.

Description: Neoprene industrial hose is extruded in continuous, seamless lengths, and spiral-ribbed construction. Hose is produced in 2, 2½, and 3" diameters in lengths to 11'. Connector sections, into which hose screws, are available for assembly of longer lengths.

(Flexible neoprene hose is product of Burton Manufacturing Co., Burton, Ohio.)

Check 3477 opposite last page.

Equipment for processing of dry powdered, granular, crystalline, or flake materials is detailed in 24-page catalog that includes specifications, engineering data, installation drawings, and illustrations. Cat 804 — B. F. Gump Co., 1325 So. Cicero Ave., Chicago 50, Ill.

Check 3478 opposite last page.



SERIES 60 FILLS ALL NORMAL STEAM TRAP REQUIREMENTS

If condensate loads are average, pressures between 10 and 400 psi, temperatures under 450° F—then Series 60 are the Yarway Impulse Steam Traps for the job.

These Yarways give you unequalled advantages of *quick heat-up and steady temperatures due to continuous sampling flow, only one moving part, low maintenance, stainless steel construction, small size and light weight, good for all pressures within range, non-freezing, six sizes to choose—PLUS low initial cost.*

Specify Yarways on your steam equipment. Buy them from 270 convenient Industrial Distributors. Over 1,250,000 Yarways already sold.

YARNALL-WARING COMPANY

125 Mermaid Ave., Philadelphia 18, Pa.

THE YARWAY FAMILY OF FINE STEAM TRAPS



SERIES 60—normal needs, pressures to 400 psi, 6 sizes. **SERIES 120**—normal needs, pressures to 600 psi, 6 sizes. **SERIES 40**—for extra heavy loads, 5 sizes. **NO. 30**—for extra light loads (½" only). **INTEGRAL STRAINER**—highest pressures and marine use, 6 sizes.

YARWAY

impulse® steam traps

Check 3479 opposite last page



PROTECT AGAINST
the consequences of
LIGHT FAILURE

PANIC
Injury
DAMAGE SUITS
THEFT

A CASE HISTORY from our files . . .

The Safety Director of a large Eastern distillery had recommended installation of Carpenter Automatic Emergency Lights. Procrastination was responsible for delaying purchase for several weeks, with the result that a simple blown fuse caught everyone unprepared.

During a night shift, lighting circuits to the Bottling Department went dead, while the machinery, fed by high-voltage lines, kept clanking on. In the resulting panic, women stumbled into the racing machines. Exit stairwells were darkened, too, and falls added to the toll. Only chance prevented loss of life.

Within days, the management installed Carpenter Automatic Lights throughout this plant and eight others.

The tragedy in this instance was the delay after the hazard had been recognized, and proper protection decided upon . . . For just one WATCHMASTER AUTOMATALITE would have prevented the misfortune. Each AUTOMATALITE now stands as a mute yet tangible symbol of the need for immediate protection.

Only "WATCHMASTER" AUTOMATALITES have EXCLUSIVE • Powerful, sealed-beam floodlights with strong center punch to illuminate long corridors and pin-point exits or critical stations, etc.

EXCLUSIVE • "Hydro-Caps" to prevent water loss from batteries. Add water only once every year or two. Lower Maintenance costs.

CARPENTER MFG. COMPANY
928 Bradley Street, Somerville 45, Mass. Telephone MOnument 6-4300

Check 3480 opposite last page



S & S Patent

NOW

- new safety
- longer life
- greater economy

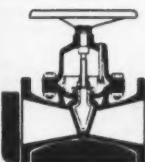
with the New Packless, Corrosion Resistant

DIA-PLUG VALVES

for liquids and gases, acids, alkalis, slurries, etc.

DIA-PLUG VALVES WILL

- INSURE PERFECT CLOSURE ALWAYS
- CUT MAINTENANCE TO A MINIMUM—Dia-Plug can be changed on the line
- WORK WITH ALMOST ANY AIR OPERATOR
- OFFER EXCELLENT THROTTLING CHARACTERISTICS
- SELF DRAINING ON HORIZONTAL LINE
- TRAVEL INDICATOR FOR HAND VALVES AT NO EXTRA COST



Write for complete details and catalog

Dia-Plug Valve Corp. • 1622 A Fillmore Avenue
Buffalo 11, New York

Heart of this new valve is a combination of rugged diaphragm and metal plug which insures dead tight closure even if the diaphragm is damaged. An important safety plus that may save a life, or many dollars in process.

The Dia-Plug requires less force to close—allowing for use of smaller, more economical air operators or minimum manual effort. Dia-Plug valves can withstand temperatures to 400° F. and pressures to 300 psi. Standard sizes $\frac{3}{8}$ " to 8" in cast iron or steel, stainless, bronze, aluminum, etc.

Check 3481 opposite last page

ENGINEERING & SAFETY

Fire-retardant rating for alkyd-based paint given by UL

Excellent finish qualities are maintained

Underwriters' Laboratories approval was recently granted to an alkyd-based, fire-retardant paint. Product contains some chlorinated resin. Although solvent used is flammable and regular safety requirements should be followed in application, resulting film is fire-retardant.

In establishing this rating flame spread rate tests were employed. This test is most generally accepted as giving best correlation with actual fire conditions.

Test Procedure

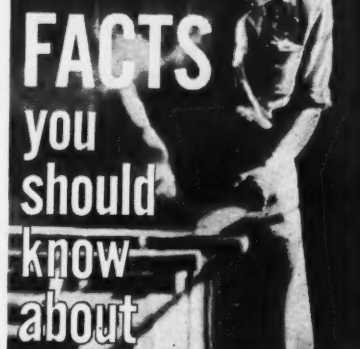
Nominal 1- by 4-inch tongue and groove Douglas Fir lumber was used for three test decks, each 25-feet long by 20-inches wide. Paint was then applied in three coats to total a coverage rate of slightly over 100 sq. ft./gal. Coated decks were allowed to condition for a period of 30 days.

Gas flames were impinged on the test deck for a measured time and the propagation of the flame noted. The extent of the propagation is compared with untreated red oak, rated at 100, and cement asbestos board, rated as 0. Test material is then given a rating between these two materials in proportion to the extent of flame propagation. Result of tests was a flame spread rating of 50-70.

Product surmounts shortcomings of earlier fire-retardant paints. It has excellent properties as a finish. Film hardness, gloss retention, toughness, and durability compare with those of conventional architectural or maintenance finishes.

(Fire-retardant paint is a product of Finishes Div., E. I. du Pont de Nemours & Co., Wilmington 98, Delaware.)

Check 3482 opposite last page. (A similar product is being manufactured by the Albi Mfg. Co., Rockville, Conn.)



FACTS
you should know about
INDUSTRIAL APPAREL

Fact #1—Acids, caustics and other damaging chemicals spell speedy ruin for ordinary work clothes of cotton or wool.

Fact #2—Worklon industrial apparel, specially made of DuPont Dacron, Union Carbide Dynel and DuPont Orion, actually resists acid and chemical deterioration . . . resists this damage up to 50 times longer than ordinary garments. This has been proved time and time again by government and industry usage tests.

Fact #3—The use of Worklon industrial apparel saves as much as 93% on your yearly work clothes costs. This, too, has been proved year after year in hundreds of plants and laboratories from coast to coast. To confirm the tremendous savings that Worklon affords, send for new illustrated catalog and comprehensive laboratory reports—yours **FREE!** Also included is an informative section on lint-free acid and caustic resistant clothing. Mail coupon today!

WORKLON

Acid and Caustic Resistant Industrial Apparel

SEND FOR **FREE**
CATALOG TODAY!

Worklon, Inc., Dept. CP-19
253 West 28th St., New York 1, N. Y.

Kindly send new Worklon catalog **FREE**.

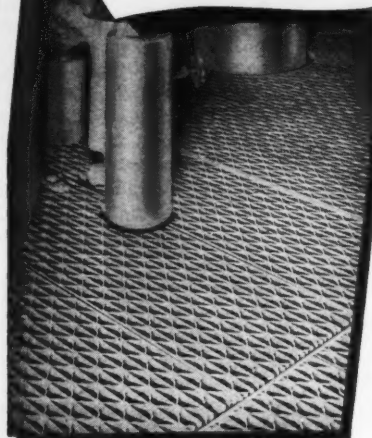
name _____
co. name _____
address _____
city _____ zone _____ state _____

Check 3483 opposite last page

CHEMICAL PROCESSING

BOILER ROOM FLOORS

**MUST
STAY
SAFE,
CLEAN**



Ashes, coal and other substances under foot often make solid floors in boiler rooms unsafe.

Such hazardous materials cannot accumulate on a floor made of Irving open steel grating. Debris falls right through, making floors always clean. Dangerous fumes can escape through open grating. Floors made of Irving Grating are clean, safe at all times... no ankle turning, tripping, slipping, hot foots. It is fireproof, self-ventilating.

**Manufacturers of Riveted,
Pressure-Locked,
and Welded Gratings of
Steel, Aluminum and other metals.**

**"A FITTING GRATING
FOR EVERY PURPOSE"**

IRVICO

IRVING SUBWAY GRATING CO., Inc.
Originators of the Grating Industry

Offices and Plants at
5050 27th St., LONG ISLAND CITY 1, N. Y.
1850 10th St., OAKLAND 23, CALIFORNIA

Check 3484 opposite last page

ENGINEERING & SAFETY

Wire cloth available in Titanium

Titanium wire cloth has been added to company's line of woven metal products. Initial production will range from 4 mesh to 120 mesh with wire diameters ranging from 0.080 to 0.001 inches.

(Titanium wire cloth is available from Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N.J.)

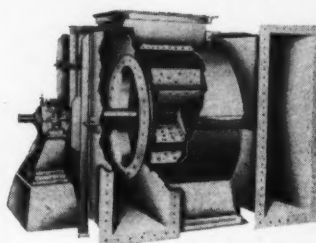
Check 3485 opposite last page.

Abrasive gases handled at high temperatures by heavy-duty fan

Uses: Units designed specifically for handling abrasive gases at high temperatures.

Features: Operational temperature range is from 20 to 850°F, in ratings from 10,000 to 500,000 cfm and pressures up to 70" of water.

Description: Heavy duty and mechanical draft fans are designed for unobstructive gas passage over open radial



Fans handle abrasive gasses at temperatures to 850°F

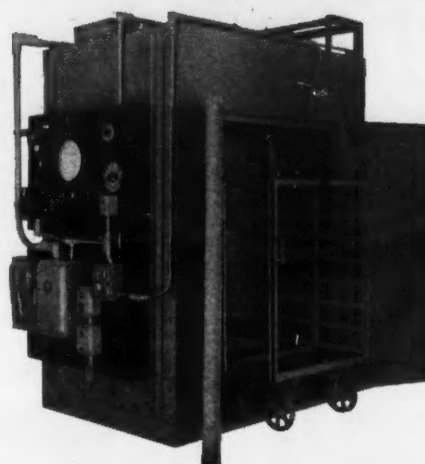
blades. This feature provides maximum self-cleaning action for the blades. For extra severe abrasive service, ribbed blade lines are used.

Housing and inlet boxes for these fans are of welded steel construction with quick opening access doors, braced for working pressures, and split for wheel removal. Unit may be equipped for capacity control.

(Series 7000 fans are product of Sturtevant Division, Westinghouse Electric Corp., Dept. T-225, 200 Readville St., Hyde Park, Boston 36, Mass.)

Check 3486 opposite last page.

Completely Controlled for Drying Quality and Safety



No matter what the chemical nature or sensitivity of material to dry, in Rockwell Recirculating Ovens you are sure of complete product uniformity, with complete operating safety.

Standard cabinet and truck type ovens (gas, electric or steam) are available with aluminized steel interiors or with special stainless steel; fume-tight; recirculating fans are interlocked with heating system for shut-off in event of power or fuel supply failure; other safety features.

For drying, baking, curing, evaporating or finishing, Rockwell Ovens are RIGHT for you. What's your heat processing problem?

Write for Bulletins 125 & 126

W. S. ROCKWELL COMPANY

2208 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

Check 3487 opposite last page

Binks spray nozzles

for washing, cooling, processing,
humidifying, dehydrating, and
hundreds of other applications.

You'll get the right nozzles quicker by calling Binks...manufacturers of one of the most complete selections ever produced.

There is a size and spray pattern for every purpose...with nozzles cast or machined from standard or special corrosion-resistant metals and materials.

MAIL COUPON
NOW!

611

Binks

A COMPLETE LINE OF
INDUSTRIAL SPRAY NOZZLES
AND COOLING TOWERS



Binks Manufacturing Company
3120-32 Carroll Ave., Chicago 12, Ill.
O. K. Binks, send me your comprehensive Spray Nozzle Catalog without obligation.

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Check 3488 opposite last page

ENGINEERING & SAFETY

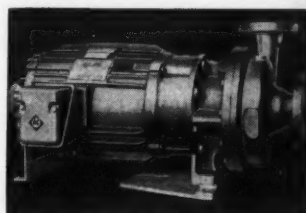
Mechanical seal, packing are eliminated in pump for volatile liquids

Uses: Unit is designed for handling costly or volatile substances at temperatures to 200°F.

Features: No mechanical seals or packing are required. Design of unit prevents contaminants from entering system through pump. Precious or hazardous liquids or vapors cannot escape system.

Description: Single-stage, single-suction pump is available in capacities to 500 gpm at heads to 250 ft. Pumps in ¼ to 1½ hp range are constructed on a fractional motor frame while units from 2 through 15 hp are on an integral motor frame.

Carbon-sleeve bearings, impervious to most known chemical and corrosive agents, are used. Thin wall can, "stator



Single-stage, single-suction pump is designed for leakless handling of costly or volatile liquids

can," passes from pump casing through air gap of motor to rear housing, sealing off stator core iron and windings from pumped liquid.

Shaft, rotor, and bearings are immersed in pumped liquid. Induction rotor, clad in corrosion resistant stainless steel, rotates in portion of fluid being pumped, and is cooled by it.

("Electri-Cand" pump is product of Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin.)

Check 3490 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

designed and erected by



FORMERLY CHICAGO STEEL TANK CO.

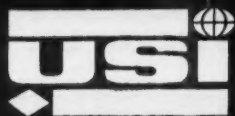
WHAT'S UP?

Big things are happening at Chicago Steel Tank Company. Our name has been changed . . . from now on we will be known as Solar Chicago division of U. S. Industries, Inc.

And that's not all!

Now we can offer you a complete processing package. A fully integrated design-engineering-fabrication-erection service. As a division of U. S. Industries, Inc., we can place the facilities of the U S I Technical Center at your disposal. In this way, we can offer comprehensive research and development studies, complete design, construction, and erection of vessels and process equipment of all kinds.

Our address and telephone number remain the same. As always, we will be glad to hear from you.



Solar Chicago

DIVISION OF U. S. INDUSTRIES, INC.

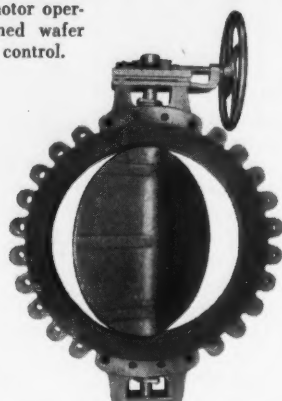
6400 W. 66th St. • Chicago 38, Ill. • Telephone PORTsmouth 7-8900

Check 3489 opposite last page

for heavy duty service ROCKWELL "WAFFER" VALVES



Wafer valve with air motor operator. Right - rubber-lined wafer valve with hand wheel control.



Compact, space-saving butterfly valves for dependable throttling and wedge-tight shut-off of air, gas, liquids and semi-solids at differential pressure to 900 psi and higher and temperatures from minus 300° to 2000°F. Manual or automatic operators. Standard sizes to 36" and larger special sizes. Write for Bulletin 580.

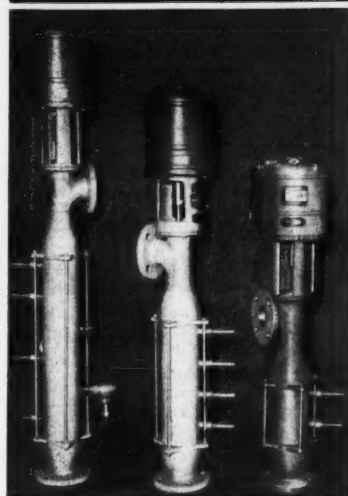
W. S. ROCKWELL COMPANY

2208 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

Check 3491 opposite last page

Fast, Highly Efficient PIPELINE CHEMICAL MIXING



American HOMOMIX®

Gives instant, uniform, complete dispersion or blending of one or more chemicals (liquid, gas, or slurry) continuously or intermittently, right in the pipeline, without a mixing tank. Permits wide range in percentage of additives to mainflow and assures quick, accurate, highly responsive mixing control. More than one mixing stage can be provided. Easily installed in any position in pipeline. Can be equipped with lift-stage. Can be made of standard or special material and protectively coated. Wide range of sizes and capacities from 2-inch to 36-inch, from less than 1 GPM to 22,500 GPM.

Write for engineering and performance data.

AMERICAN WELL WORKS



MIXING, PUMPING, WATER & WASTE TREATMENT EQUIPMENT
122 NORTH BROADWAY, AURORA, ILLINOIS
Sales Offices: Chicago, New York and other principal cities

OUR
91st
Anniversary

Check 3492 opposite last page

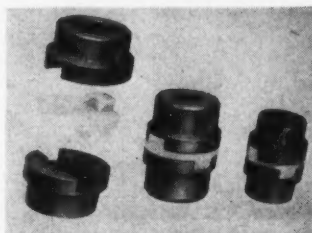
ENGINEERING & SAFETY

**Replaceable nylon disc
absorbs shock
in coupling**

Provides non-conductive joint

Uses: For fractional horsepower coupling applications.

Features: Unit employs replaceable molded nylon discs to absorb shock and misalignment. Due to high dielectric



Free-floating nylon center member provides outstanding resistance to shock

factor of nylon insert and complete separation between shafts, unit provides a non-conductive joint.

Description: Couplings are produced in three stock sizes, rated 1/8, 1/4, and 1/2 horsepower at 1750 rpm. To permit free-floating action, coupling is made with two-jaw hubs of cold rolled steel. These are locked to shafts of driver-driven by cup-point set screws.

Stock bores are from 3/16" to 5/8" by 1/16" increments with tolerances held to plus .001" minus 0". No service or lubrication is required.

(Type CN couplings are product of Climax Metal Products Co., 863 E. 140th St., Cleveland 10, Ohio.)

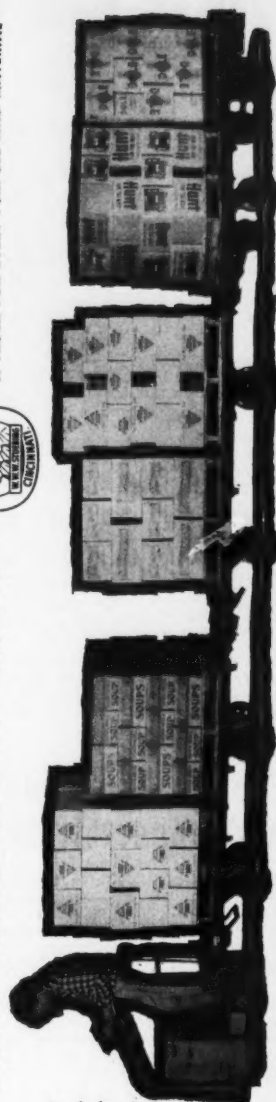
Check 3493 opposite last page.

Insulating material for pipes, tanks, vessels, and other cold equipment is detailed in four-page bulletin that describes and illustrates how material is applied, presents instructions on how to specify, and includes chart for figuring insulation necessary to prevent condensation on pipes over a wide range of conditions. "Faster With Fastab" — Fastab Insulations, Inc., 304 C.T.S. Building, Cleveland 14, Ohio.

Check 3494 opposite last page.



Hydro-Lectric A GREAT NAME IN LIFT TRUCKS



This powerful Hydroelectric Tractor hauls one or multiple units with speed, safety and ease of operation. Features the exclusive DYNA-DUAL POWER UNIT. Powerful enough to pull loads of 6000 lbs. or more at low cost.

Write for Bulletin KT

LIFT TRUCKS, INC.

2427 Spring Grove Avenue, Cincinnati 14, Ohio

Check 3495 opposite last page

NEW GIANT narda SonBLASTER



Generator G-5001
500 watts output
Transducerized Tank NT-5001
Capacity: 10 gallons
Dimensions: 20" L x 11 1/2" W x 10" D

Generator features tank selector and load selector switches on front panel to operate one or two NT-5001 tanks alternately. Other combinations of tanks and submersible transducers available from stock; larger tanks available on special order.

\$1325

For mass-production cleaning and high capacity chemical processing!

Here's a new Narda SonBlaster ultrasonic cleaner with tremendous cavitation activity and generating capacity! Featuring full 500 watts output, this SonBlaster is available with a fully transducerized giant 10-gallon capacity tank. In addition, it will operate from six to 10 Model NT-605 high energy submersible transducers, at any one time, in any arrangement in any shape tank you need up to 70-gallon volume.

Install this new Narda SonBlaster, and immediately you'll start chalking up savings over costly solvent, vapor or alkaline degreasing methods! You'll save on chemicals and solvents, cut maintenance and downtime, eliminate expensive installations, save on floor space, and release labor for other work. But perhaps most important, you'll clean faster, cut rejects, and eliminate bottlenecks.

Whether you're interested in mass-production cleaning or degreasing of mechanical, electronic, optical, or horological parts or assemblies... rapid, quantity cleaning of "hot-lab" apparatus, medical instruments, ceramic materials, electrical components or optical and technical glassware... or in speeding up metal finishing and chemical processing of all types—you'll find this new SonBlaster will do your work faster, better and cheaper. Write for more details now, and we'll include a free questionnaire to help determine the precise model you need. Address: Dept. CP-20.

Consult with Narda for all your ultrasonic requirements. The SonBlaster catalog line of ultrasonic cleaning equipment ranges from 35 watts to 2.5 KW, and includes transducerized tanks as well as immersible transducers which can be adapted to any size or shape tank you may now be using. If ultrasonics can be applied to help improve your process, Narda will recommend the finest, most dependable equipment available for immediate delivery from stock—and at the lowest price in the industry (\$175 up)!

For custom-designed cleaning systems, write to our Industrial Process Division; for information on chemical processing applications, write to our Chemical and Physical Process Division; both at the address below.



Check 3496 opposite last page

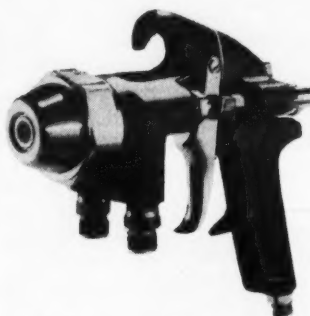
ENGINEERING & SAFETY

Rigid urethane foam sprayed on surfaces without sagging

Uses: For applying rigid urethane foam.

Features: Device makes possible spraying of rigid urethane foam on vertical or overhead surfaces without sagging.

Description: Spray gun is designed to mix approximately equal quantities of materials used for urethane foam by discharging them through concentric openings, atomizing them with an enveloping air blast, and completing mixing by means of a ring of air jets. There is no contact of materials within spray gun and no



Sprays urethane foam on vertical or overhead surfaces without sagging

build-up occurs on any critical surface during continuous operation.

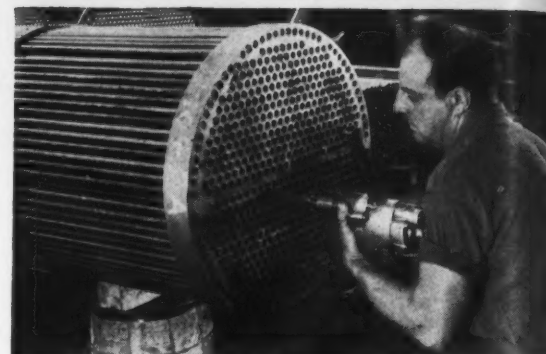
Each of the materials is delivered to the gun by a positive displacement pumping system. Air is supplied by a regular high pressure air system. Thicknesses of from 3/16" to as much as 2" can be built up in continuous operation. Price of spray gun is \$1200.

(Spray gun is custom-produced by The DeVilbiss Company, 296 Phillips Ave., Toledo 1, Ohio.)

Check 3497 opposite last page.

Industrial fans are described in 16-page bulletin that presents construction features, applications, fan arrangements, and selection information. Bul I-585 — The Day Sales Company, 810 Third Ave., N. E., Minneapolis 13, Minn.

Check 3498 opposite last page.



MORE PRODUCTION... LESS DOWN TIME Republic ELECTRUNITE Stainless Tubing ... Fully Solution Annealed

Republic ELECTRUNITE® Stainless Steel Tubes bend without wrinkling, slide effortlessly into tube sheets, roll-in and expand evenly. ELECTRUNITE is produced from highest quality flat-rolled electric furnace steel, carefully checked for chemical analysis, physical properties, exact thickness and width. Each ELECTRUNITE Stainless Tube is fully solution annealed for maximum corrosion resistance. Call your Republic ELECTRUNITE distributor. Send for free 60-page brochure. Write today!



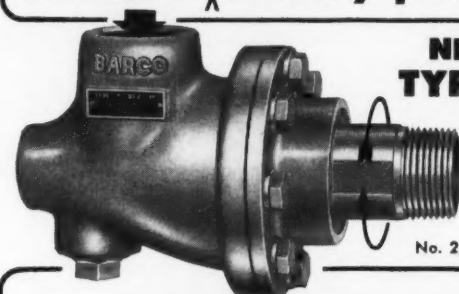
REPUBLIC STEEL

STEEL AND TUBES DIVISION
207 East 131st Street • Cleveland 8, Ohio



Check 3499 opposite last page

Better Need a rotary joint?



Patent No. 2,836,439

—it's BARCO!

For countless applications, Barco's new Type C Rotary Joint will give you the best operating records you've ever had—and for LESS COST!

"CRACK-FREE" CHROME PLATED SLEEVE—A standard Barco feature. Minimizes corrosion, friction, wear. Stainless steel spring also standard.

RESISTS SEAL RING BREAKAGE—The spherical seal ring is under compression, not tension, loading. Self-adjusting for wear. Seal withstands shock loads and alternating hot and cold service.

WIDE SPACED BEARINGS—Two, instead of one... increased bearing area. No lubrication required. Lowest friction.

200 P. S. I. STEAM RATING—Heavy duty service at no extra cost. Eight sizes, 1/2" to 3". Send for new Catalog 310 today. **BARCO MANUFACTURING CO., 537B Hough Street, Barrington, Illinois.**

Check 3500 opposite last page

CHEMICAL PROCESSING

THAT'S INTERESTING

Conveyor belt sets record

Longest permanent cross country transport belt conveying system, 5½ miles in length, is being constructed to carry crushed limestone and shale. Belt will transport materials at rate of 1000 tons per hour from Lawrence, Okla. quarry to Ada, Okla. cement mill. Entire system contains seven conveyors—longest one is 11,920 ft and will require single rubber belt more than 4½ miles long. (Link-Belt News, Link-Belt Company)

Tubeless tire puncture seal

Rubber powder that makes any tubeless passenger tire puncture sealing has been developed by United States Rubber Co. It can be installed by any service station at a nominal charge.

Called Air Guard, powder permits safe driving for at least 48 hours after puncture.

For more information on product at right, specify 3501 see information request blank opposite last page.



Circular sidewall of B&W Insulating Firebrick in an oil heater



How B&W Insulating Firebrick cut processing costs

Here are four *key* reasons why B&W Insulating Firebrick reduce over-all costs in chemical and petroleum process furnaces:

High Hot Load Strength—B&W IFB provide maximum load-bearing capacity under operating temperatures. Many oil heaters have been built with walls 80 feet high with no intermediate support.

Low Heat Storage—Cost-cutting B&W IFB have the lowest heat storage of any insulating firebrick. Since B&W IFB cool off fast, they protect expensive alloy tubes in the event of forced shut-down...

make possible quick access to the furnace for inspection. They also reach operating temperature quickly, reducing cycle time and fuel bills.

Long Life—B&W Insulating Firebrick are *long* lasting because of the exceptional refractory nature of their base ingredients and the high processing temperatures to which they are subjected during manufacturing.

Short Installation Time—You save materially with B&W Insulating Firebrick because they are machined to size. They may be modified to fit door openings, peepholes, and other special conditions because

they can be cut, drilled or shaped on the job with ordinary woodworking tools.

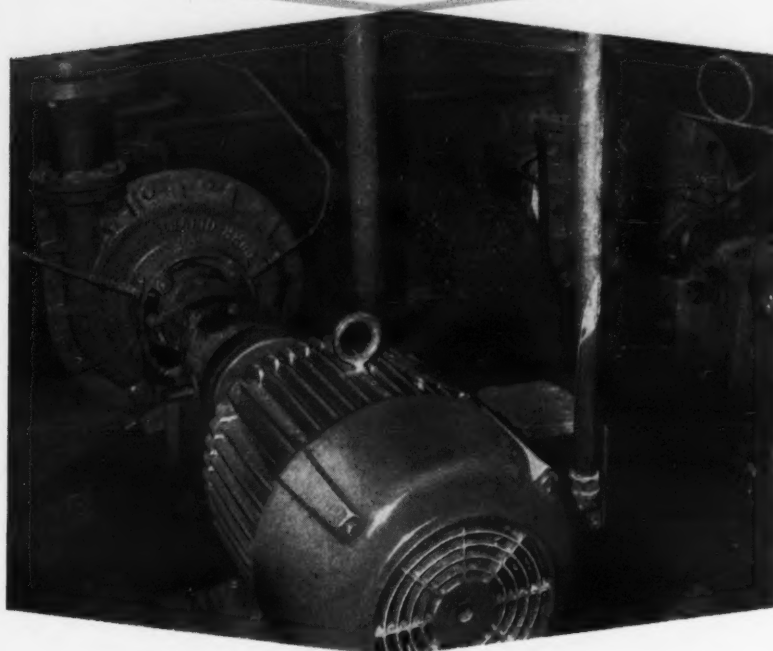
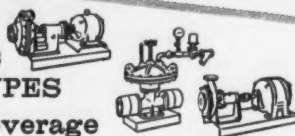
These sound reasons explain why process furnace builders and operators specify B&W Insulating Firebrick. Learn how these lightweight brick can help you save money. Your B&W representative will be glad to give you facts and figures.



B&W REFRACTORIES PRODUCTS:

B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick
• B&W Insulating Firebrick • B&W Refractory Castables, Plastics and
Mortars • B&W Silicon Carbide • B&W Ramming Mixes • B&W Kaowool

only DORR-OLIVER makes
3 DIFFERENT PUMP TYPES
for complete chemical coverage



First Dorr-Oliver Hypalon-lined PUMPS STILL GOING STRONG at Kennametal Inc.

Handling neutralized wastes from nitric, muriatic, and hydrofluoric acid leaching operations which occasionally, due to large process surges, are not completely neutralized calls for corrosion and abrasion-resistant pumps.

The job is handled at Kennametal's Kingston Station Plant, Latrobe, Pennsylvania, by four Olivite pumps, two of which are shown above. Still going strong after long and continuous use, these pumps have the distinction of being the first units manufactured by Dorr-Oliver with a lining of Dupont's Hypalon elastomer. Kennametal reports that no repairs have been necessary.

Satisfactory performance has made this type of pump the choice for a wide range of applications where resistance to corrosion is the important factor. It is one of the three specialized pump types made by Dorr-Oliver—the only major manufacturer offering complete coverage of chemical industry pumping requirements. For more information, write for Bulletin No. 5000.



Olivite—T.M. Reg. U.S. Pat. Off.

Hypalon—Reg. T.M. E. I. duPont de Nemours & Co.

Check 3502 opposite last page

PLANT ENGINEERING MAINTENANCE & SAFETY

For maximum hand and arm protection in working with dangerous mineral acids, simply specifying rubber gloves is not sufficient. Style, length, and weight are equally important. At Becton, Dickinson and Company . . .

Gauntlet rubber gloves key safety in strong acid service

Problem: Sulfuric, hydrofluoric, and chromic acids are used in manufacturing precision clinical thermometers, hypodermic needles, and surgical instrument at Becton, Dickinson and Co., Rutherford, N.J. Protection of workers' hands and arms from splashes, drips, and spray is of prime importance to B-D management since injury prevention and personal safety receive top priority in all operations.

Solution: Although rubber gloves were the obvious answer to hand protection, glove composition is only one factor in acid service. Equally important are style, length, and weight.

Following recommendations of glove manufacture, B-D selected the following:

Hydrofluoric acid etching bath, where racks of thermometers are immersed, dictated Buna-N gloves with gauntlets extended to the elbow. This quick-acting corrosive on human skin and

underlying tissue causes lesions that are very slow to heal. Operators are made fully aware of dangers, and gloves and thermometers are thoroughly rinsed after each operation.

Plating solution of chromic acid is used for a chrome finish on hypodermic hubs. Here again Buna-N, elbow-length protection is used by operators unloading hubs from chrome barrels where forearms are exposed repeatedly.

The strong sulfuric acid dip employed for freeing hypodermics of contamination is best withstood by natural rubber. This job requires not only acid resistance but good abrasion resistance and long-wearing characteristics for handling heavy stainless steel racks and hoist operation. Elbow-length gauntlets provide essential protection and long life in this rugged service.

In Buna-N gloves, fit is quite loose, allowing freedom of action and maximum comfort. Natural rubber gaunt-



Placing thermometers in hydrofluoric acid etching bath. Buna-N gauntlets prevent injury from splash or spray of this quick-acting corrosive



When the design calls for
an indicating gauge, specify
the best—

MARSH

New catalog covers gauges for every need

MARSH INSTRUMENT CO.
Sales Affiliate of J. P. Marsh Corporation
Dept. Z, Skokie, Ill.
Marsh Instrument & Valve Co. (Canada) Ltd.
8407 103rd Street, Edmonton, Alberta
Export Dept.
3501 Howard Street, Skokie, Ill.

Check 3503 opposite last page



Variable Speed Drive
Output adjustable from
0 to 150 ml/sec.

"MIDGET" Constant Discharge
2 to 20 cc/sec. range

Fixed Capacities
11 to 228 ml/sec;
10 to 217 gph.

MAISCH

METERING PUMPS

- COMPLETELY SANITARY, STAINLESS STEEL CONSTRUCTION.
- POSITIVE DISPLACEMENT—SMOOTH, UNIFORM, NON-PULSATING FLOW.
- PUMP HEADS DEMOUNTABLE WITHOUT TOOLS . . . FOR INSPECTION, CLEANING AND STERILIZING.
- DISPENSE BOILING-HOT OR ICE-COLD WATERY LIQUIDS OR HIGHLY VISCOUS FLUIDS.

Maisch Metering Pumps are simple in design, ruggedly built for long service, and can be depended on to maintain accuracy indefinitely. Exclusive design features insure optimum performance. Particularly suited for handling chemicals, syrups, oils, glue, processing solutions, etc. Quick demountable or fixed heads. Fixed capacity pumps available in wide range of output. Pumps in stock for immediate delivery. Write for complete details and prices.

MECHANICAL PRODUCTS CORPORATION
174 North Ogden Avenue • Chicago 7, Illinois

Check 3504 opposite last page

ENGINEERING & SAFETY

lets, relatively heavy-weight of necessity, feature curved finger design. Rounded finger-tip construction on all gloves permits efficient control of operations.

Results: Care in selection of the right gloves for each job, and thorough instruction of operating personnel, have enabled B-D to compile an outstanding safety record in handling and working with these strong acids. Gloves have not only assured personal safety but improved operating efficiency on the job.

(Wil-Gard gloves were supplied by Wilson Rubber Company, Canton, Ohio.)

Check 3505 opposite last page.

High-strength grout resists corrosion and vibration

Uses: For grouting machinery where vibration or other operating conditions are severe.

Features: Because of its exceptional physical and chemical properties, material can successfully withstand vibration, load, temperature, and corrosion conditions where conventional materials would fail. Savings are also provided in terms of longer grout life and shorter downtime.

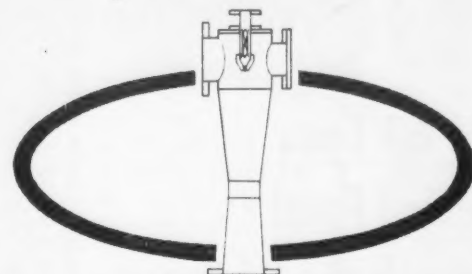
Description: Grout is formulated from modified resin and inert fillers plus special hardeners. It may be poured in depths of six inches at one time. Small equipment can be returned to operation 24-hours after final pour. A 48-hour cure at normal temperatures is safer for larger pieces of equipment that create greater stresses on grout.

Physical properties include tensile strength of 1950 psi, compression strength of 15,000 psi, and bond strength to steel of approximately 1000 psi. Material has high impact strength and abrasion resistance, virtually no shrinkage, imperviousness to oils, and low moisture absorption.

(No. 648 grout is product of The Ceilcote Company, 4834 Ridge Rd., Cleveland 9, Ohio.)

Check 3506 opposite last page.

CROLL-REYNOLDS *Jet-Venturi*



Fume Scrubbers

*minimize odors
clean and purify air
and other gases
without fan or blower*



ADDITIONAL APPLICATIONS

*to recover valuable solids
use as Jet Reactors*

SEND TODAY FOR COMPLETE CATALOG



Croll-Reynolds CO., INC.

Main Office: 751 Central Avenue, Westfield, N. J.

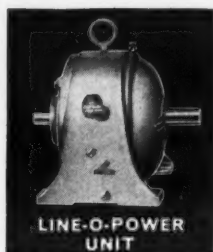
New York Office: 17 John Street, N. Y. 38, N. Y.

CHILL VACTORS • STEAM JET EVACTORS • AQUA VACTORS
FUME SCRUBBERS • SPECIAL JET APPARATUS

Check 3507 opposite last page

**Puts 60 Tons
of Plant Food
Through the Wringer
Every Hour —**

**NEVER MISSES
A TURN!**



Driving a giant concurrent dryer, 50 feet long and 7 feet in diameter, with a capacity of 60 tons of plant food per hour takes a reducer with plenty of stamina.

Add the fact that the reducer must withstand heavy shock loads and continuous 24-hour-a-day operation during peak production periods, and you've got a problem.

Yet—the Foote Bros. LINE-O-POWER Reducer used to rotate this unit was installed more

than two years ago and has never been shut down for maintenance.

Dependable, trouble-free performance of Foote Bros. Drives in the chemical process industry is no accident. One of many things you can count on when you specify or install a Foote Bros. Drive is rugged, stand-up-and-take-it stamina. We build them that way.

There's a Foote Bros. unit available to meet your drive requirements. Ask your nearby Authorized Foote Bros. Distributor to recommend the right unit for your requirements. Write for LINE-O-POWER Engineering Manual LP-3.

**Easily operated cleaner
unclogs condenser
quickly**

Unit weighs only 10 lbs,
needs no supports

Uses: Unit is designed to
clean severely clogged con-
denser tubes.

Features: Weighing only 10
lbs, unit can be easily oper-
ated without using any sup-
porting rigging.

Description: Condenser
cleaner is operated with sin-
gle-stage geared air-driven
motor to provide all power



Condenser cleaner quickly and
thoroughly cleans severely
clogged tubes up to 1" in diam

necessary to clean even com-
pletely plugged tubes. Motor
operates at 38,000 rpm, and its
speed is quickly and accurate-
ly controlled by feathering
valve at handle.

Built-in flushing system
controlled by stainless steel
sleeve valve keeps drill head
cool and removes cuttings.

(CC-475 condenser cleaner is
product of The Airetool Mfg.,
Co., 328 S. Center St., Spring-
field, Ohio.)

Check 3509 opposite last page.

**Ebullient cooling product
gives freeze protection
in engine, return line**

A product specifically de-
signed for use in ebullient
cooling by means of a boiling
heat-transfer medium has been
developed. This material gives
freeze protection to —45°F
both in engine and condensate
return line. The product is
recommended for use in a 54%
(by weight) solution in water.
Ebullient cooling has had

100 YEARS
SERVING INDUSTRY
1859-1959

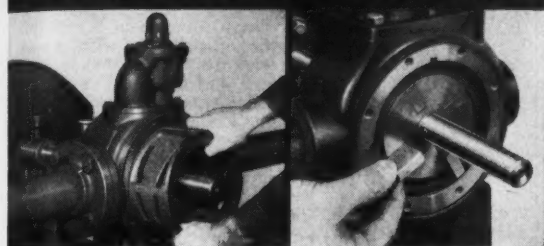
FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION • 4555 SOUTH WESTERN BOULEVARD • CHICAGO 9, ILLINOIS

Check 3508 opposite last page

REPLACING THESE PARTS SAVES BUYING A WHOLE NEW PUMP



REPLACEABLE CYLINDER LINER

REPLACEABLE VANES

With Blackmer rotary pumps, normal wear occurs on these easily replaceable parts. New vanes and cylinder liner can be installed quickly without disconnecting either the piping or the motor. Often, after years of service, you can make a Blackmer pump good as new for as little as 15% of the cost of a whole new pump. For more details, ask for Bulletin One.



"liquid materials handling" equipment

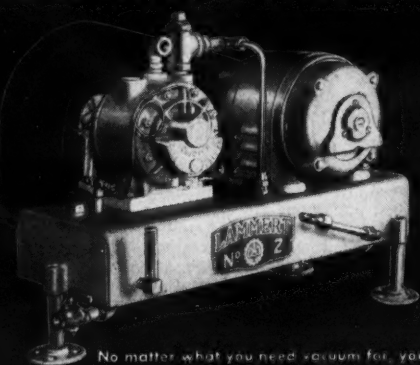
BLACKMER

BLACKMER PUMP COMPANY, GRAND RAPIDS 9, MICH.

See Yellow pages for your local sales representative

Check 3510 opposite last page

VACUUM LAMMERT PUMPS



No matter what you need vacuum for, you will get dependable service from automatically lubricated Lammert pumps. Capacities—4.3 to 225 cubic feet per minute. From medium to high vacuum (up to 20 microns of barometer).

Write for catalog showing the complete line, including specifications, of Lammert pumps and compressors.

LAMMERT & MANN CO., INC.

1753 Walnut Street, Chicago-12, Illinois, SEeley 3-0383

Check 3511 opposite last page

ENGINEERING & SAFETY

limited acceptance due to cold weather problems. Water, generally used as a coolant, must have a freeze-point depressant. Although water in the engine itself may be protected with standard anti-freezers, vapors produced by the boiling mixture contain only water which can freeze in condensate return line.

(Complete information on Dowtherm 209 and its use in ebullient cooling may be obtained from The Dow Chemical Company, Midland, Mich.)

Check 3512 opposite last page.

Sturdy, plastic ladder has locked-in rungs, is fire-resistant

Uses: For general maintenance applications.

Features: Hollow tubular construction of both siderails and rungs, with Hetron(R)-glass fiber compression-molded plugs at extremities, reduces weight and provides maximum strength without requiring supplementary interior reinforcing. Ladder contains no materials that will conduct electricity.

Description: Safety ladder is constructed of Hetron(R) polyester resin reinforced with glass fiber. Rungs are rough-surfaced to prevent slipping, while siderails are suitable size for easy gripping and remain smooth and non-splintering. Plastic ladder is inherently impervious to exposure, rot and corrosion, does not warp, split or absorb water.

It withstands temperatures up to 250°F and to minus 50°F with no physical change. Tests indicate that rungs withstand static weight of more than 1000 lb.

("Allsafe" ladder is product of American Allsafe Co., Inc., 1245 Niagara St., Buffalo, N.Y.)

Check 3513 opposite last page.

(Hetron polyester resins are products of Durez Plastics Div., Hooker Chemical Corporation, Box 344, Niagara Falls, New York.)

Check 3514 opposite last page.

Store or ship your products in



CANS for CHEMICALS

a wide range of styles,
shapes, and sizes offer

POSITIVE PROTECTION

The variety of sizes and types of ELLISCO cans available to package your dry, semi-liquid or liquid products is almost as great as their uses. These popular containers are available in square, rectangular or round types with snug-fitting slip covers, single friction or double friction plugs, or screw caps to seal contents in, dust and moisture out.

ROUND CANS: ¼" to 17½" Diameters. 1½" to 30" Body Heights.

SQUARE CANS: 2¼" x 2¼" to 11½" x 11½" Base Dimensions. 2" to 12" Body Heights.

RECTANGULAR CANS: 2¼" x 1¼" to 7¼" x 5½" Base Dimensions. 2" to 12" Body Heights.

Many types and sizes are available from stock. Special shapes and sizes can be made to order. Write, wire or call for full details.

GEORGE D. ELLIS & SONS, INC.

4018 N. AMERICAN ST., PHILADELPHIA 40, PA.
BALDWIN 3-3405



ROUND SLIP COVER CANS
May be tape sealed
if air tight closures
are required.



LITHOGRAPHED CANS
Cans of all shapes
and sizes may be
lithographed in
your design and
color combinations.



ROUND CORNERED,
SQUARE AND
RECTANGULAR
CANS

Check 3515 opposite last page

TRY DARCOVA PUMPCUPS

FOR

- Higher pump efficiency
- Lower pump maintenance



Cross-section of the conventional
and 45° bevel type Pumpcups

IT'S a fact that hundreds of reciprocating pump and cylinder users today are standardizing on Darcova Pumpcups because they eliminate fluid slippage, costly down-time and maintenance!

It's easy to check these claims right in your own plant. Behind this exceptional Darcova Pumpcup performance lies texture-engineering and cup design that conform precisely to pressure-temperature-fluid conditions.

Pumpcups of various types are available in a complete range of sizes and texture-engineered compositions for your reciprocating pump and cylinder requirements.

Why not get all the facts? Send today for Pumpcup Bulletin No. 5503.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.



TRADE MARK

PUMPCUPS

Check 3516 opposite last page

Improve product
quality and
uniformity

Specify, insist on

Ludlow-Saylor

WIRE CLOTH & SCREEN

FILTERING, STRAINING, SIZING

... whatever the job ... if you have a problem of corrosion, high pressure, vibration, heat, abrasion ... L-S has the cloth or screen in stock to meet your exacting requirements, or can precision-weave it to your specifications.

L-S Wire Cloth or Screen insure more uniform product quality, higher output—lasts longer, cuts downtime and replacement costs. The best actually costs less ... Be sure you order L-S.

Write for Condensed Screen
Reference Catalog

L-S Cloth and Screens are woven from any steel including high-carbon, oil-tempered, stainless and other alloys; Monel, bronze, copper, brass or any metal that can be woven into wire.



LUDLOW-SAYLOR
WIRE CLOTH CO.
602 S. Newstead Ave. • St. Louis 10, Mo.

Sales Offices:

BIRMINGHAM	1727 Sixth Ave., No.
CHICAGO	6261 W. Grand Ave.
PITTSBURGH	Union Trust Bldg.
HOUSTON	5638 Harvey Wilson Dr.
LOS ANGELES	Star Wire Screen & Iron Works, 2515 San Fernando Road.

Check 3517 opposite last page



new literature

Begins on page 19

Piston ring line is described in 16-page catalog that also describes and illustrates special rings. Piston ring cat — C. Lee Cook Company, Div. of Dover Corp., 932 South 8th St., Louisville 3, Ky.

Check 3443 opposite last page.

Analgesic-antipyretic compound, N-acetyl-p-aminophenol (APAP), is described in 24-page pamphlet. Chemical, pharmacological, and clinical literature on the subject is reviewed and summarized. APAP pamphlet — New York Quinine & Chemical Works, 50 Church St., New York 8, N. Y.

Check 3518 opposite last page.

Floor patch that sets quickly for repairing broken floors in plants is detailed in brochure that illustrates application steps. Instant-Use Brochure — Flexrock Company, 3611 Filbert St., Philadelphia 1, Pa.

Check 3533 opposite last page.

Pushbutton loading of box cars and trucks by one man is subject of bulletin on mobile power-driven conveyor for bags and packages that includes a stacker belt which practically eliminates hand labor. Bul 75 — Power-Curve Conveyor Co., 2185 So. Jason St., Denver 23, Colo.

Check 3519 opposite last page.

Pressure regulators, external pilot-operated, that feature simple installation and low maintenance are detailed in Bul 471A — Kieley & Mueller, Incorporated, 64 Genung St., Middletown, N.Y.

Check 3393 opposite last page.

Condenser theory opens technical bulletin of 12 pages devoted to company's line of barometric condensers. Design features, construction, operation, and application are demonstrated with sectional drawings in color. Bul 5AA — Schutte and Koerting Co., Dept. JA-13, Cornwells Heights, Bucks County, Pa.

Check 3520 opposite last page.

Liquid level controls that do not have floats or any moving parts in liquid are described in catalog. Relays, starters, combinations, and special controls are covered and many application diagrams shown. Liquid level controls cat — B/W Controller Corp., 2204 E. Maple Rd., Birmingham, Mich.

Check 3395 opposite last page.

Box dump attachment for manufacturer's fork trucks with capacities from 2000 to 10,000 lb is illustrated and described in catalog sheet. Attachment is shown in operation, and engineering drawings of both attachment and typical containers are included. Box dump attachment cat sheet — The Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 3, Ohio.

Check 3521 opposite last page.

Air separation formulas are contained in helpful booklet available from manufacturer of centrifugal air separators for range from 60 to 400 mesh. "Formulas Applicable to Air Separation" — Rubert M. Gay Div., Universal Road Machinery Co., 117 Liberty St., New York 6, N.Y.

Check 3154 opposite last page.

Controlled capacity pumps — for transfer of liquids in metered quantities are described in four-page bul. Plunger and diaphragm design pumps are illustrated and specifications given. CC Pumps — CC Pump Div., Clark-Cooper Co., Inc., Palmyra, (Burlington Co.) New Jersey.

Check 3522 opposite last page.

Pump cups of various sizes and types for reciprocating pump and cylinder requirements are covered in Pumcup Bul 5503 — Darling Valve & Manufacturing Co., Williamsport 4, Pa.

Check 3516 opposite last page.

Pressure leaf filters are detailed in 8-page bulletin that illustrates and describes construction, points out features, and lists specifications. Bul 146 — T. Shriver & Co., Inc., 810 Hamilton St., Harrison, N. J.

Check 3523 opposite last page.

Automatic emergency lights for protection against plant light failure are described in company literature. Manufacturer claims batteries need water added only once every year or two. Automatalite literature — Carpenter Mfg. Company, 928 Bradley St., Somerville 45, Mass.

Check 3480 opposite last page.

Turbine flowmeter, which translates liquid velocity into a millivolt signal proportional to flow rate using a propeller, is described in four-page Spec Sheet 10C1505 — Fischer & Porter Co., 786 Jacksonville Rd., Hatboro, Pa.

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Pneumatic material handling system that is said to be self-cleaning and dust free is detailed in company Bul 18-D — Sprout-Waldron Mfg. Co., Logan St., Muncy, Pa.

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Liquid-level gages and valves are illustrated in eight-page catalog. Specifications are given. Cat 335 — Jerguson Gage & Valve Co., 80 Adams St., Burlington, Mass.

Check 3525 opposite last page.

Recording annunciator helps attain highest quality products by continuously monitoring all process variables. Bul 102 — Panellit, Inc., 7401 N. Hamlin Ave., Skokie, Ill.

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Vibrator and feeder data sheet on water-, oil-, or air-operated explosion-safe units contains descriptions, data, and specifications for three vibrators and three vibratory feeders. Vibrator, feeder data sheet — Syntron Co., 110 Lexington Ave., Homer City, Pa.

Check 3526 opposite last page.

Inert gas generators claimed to require minimum maintenance and attendance are subject of manufacturer's bulletin that provides detailed information and ideas. Bul I-10 — The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore 2, Md.

Check 3474 opposite last page.

Organic intermediates and industrial chemicals, about 400 of them, are listed in bulletin. Chemicals are used for manufacture of dyes, pharmaceuticals, and related compounds. New Products Bul — Hummel Chemical Company, Inc., 90 West St., New York 6, N. Y.

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Vaneaxial fans with adjustable blades for industrial and commercial applications are described and illustrated in 16-page bulletin that shows construction and installation and provides complete specifications. Fan Bul 268F-80 — Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa.

Check 3451 opposite last page.

How processing industry firms gain quality for their products is shown in ten-page booklet which describes typical installations for evaporation, crystallization, filtration, pulp and spray drying. "Processing Profiles" — Whiting Corporation, 15600 Lathrop Ave., Harvey, Ill.

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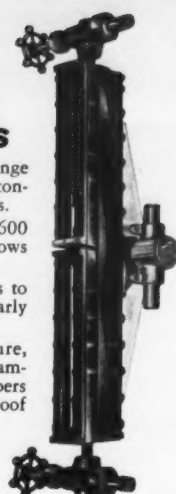
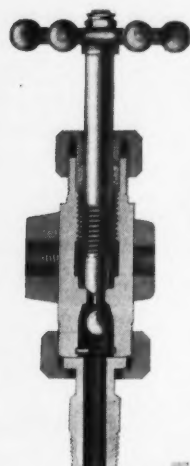
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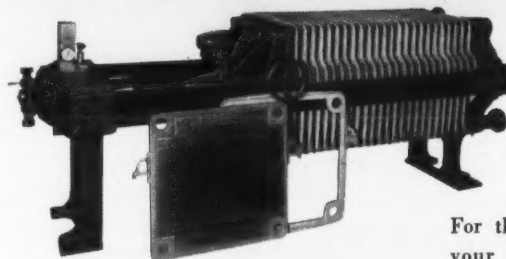
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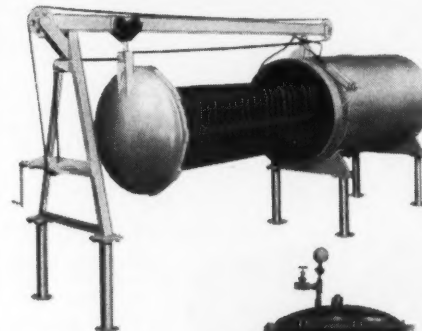
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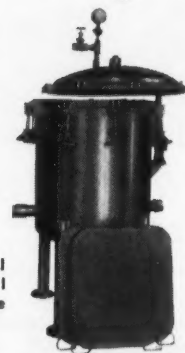
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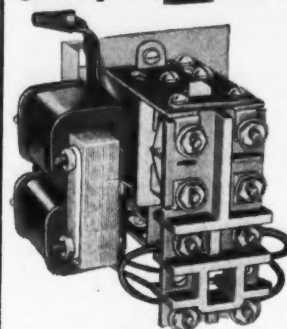
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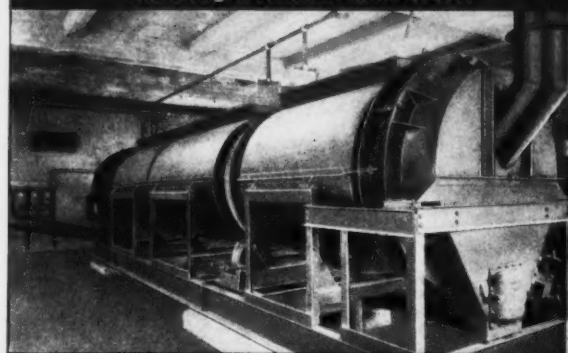


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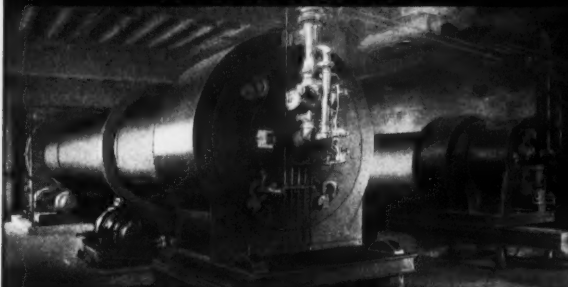
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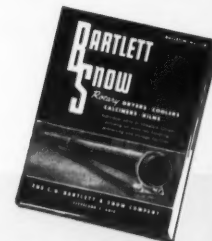
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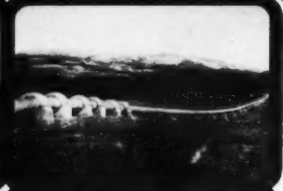
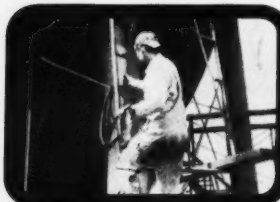
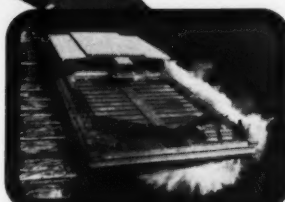


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